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TO THE LORDS OF HER MAJESTY'S MOST HONOURABLE PRIVY COUNCIL.

My Lords,

In obedience to the Public Health Act, 1858, I herewith submit to your Lordships, for presentation to Parliament, my Report of the proceedings which your Lordships, under that Act, directed to be taken during the year 1863.

I have the honour to be,
My Lords,
Your Lordships' obedient Servant,
JOHN SIMON.

Medical Department of the Council Office,
8, Richmond Terrace, S.W.,
March 31st, 1864.

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THE proceedings which the Lords of Her Majesty's Council took during the year 1863 in matters concerning the public health may be grouped under three general heads:—

Proceedings threefold.

first, there was continued the superintendence of public vaccination, including the arrangements by which the national supply of vaccine lymph is maintained, and the arrangements by which effect is given to their Lordships' order as to the qualifications of contractors for public vaccination;

1. As to vaccination.

secondly, there was continued the systematic investigation, which for some years past has been in progress, as to the distribution of disease among different sections of the community, and as to the circumstances by which that distribution is regulated;

2. As to distribution of disease.

thirdly, there were miscellaneous proceedings, sometimes with local inspection, but more commonly in the form of correspondence with local authorities, in relation to particular outbreaks of disease, and as to the local administration of laws concerning the public health.

3. Miscellaneous.

I. PUBLIC VACCINATION.

1. *District Inspections.*

1. Vaccination.

In superintendence of public vaccination, the Lords of the Council during the year 1862 ordered the inspection of 1,143 vaccination-districts comprised in 194 different unions or parishes. Of the 1,143 districts, 232 (namely, all the vaccination districts of the Metropolis) were inspected in part by Dr. Seaton and in other part by Dr. Buchanan, and are reported on by those two gentlemen conjointly. Of the remainder, the inspections were made in 205 cases by Dr. Seaton, in 507 cases by Dr. Stevens, and in 199 cases by Dr. Sanderson.

The four appended summary reports of the inspectors represent the present state of public vaccination in the Metropolis (as defined by its Local Management Act) in the counties of Lancashire, Cheshire, and Yorkshire, and in parts of Wales, Herefordshire, Cumberland, Gloucestershire, Somersetshire, and Devonshire.

On several former occasions I have written so fully on the very unsatisfactory working of our system of public vaccination, that now (since I have nothing but the same story to tell) I need only refer to the abundant further evidence which the appended reports contain in condemnation of that system and of its working.*

* See, for instance, of different kinds, in Dr. Seaton's report, the cases of Cardiff, Ross, York, Scarborough, and Hull,—in Dr. Stevens's report the extreme cases shown in his Table D., and in some others of his tables,—in Dr. Sanderson's report, the cases of Axbridge Union, and of the districts of Uley, Swymbridge, Winkleigh, Bideford, Tetbury, and St. Decuman's,—and, as one ample illustration, the account which Drs. Seaton and Buchanan give of the vaccination of London.

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But while thus omitting to dwell in detail upon evils which I have already exposed, I would advert, though very briefly, to the result which those evils are producing. Small-pox, instead of being virtually extirpated from among us, is continuing to be a considerably fatal disease. Small-pox, which for eight consecutive years in the Grand Duchy of Baden, and for 13 consecutive years in the city of Copenhagen, took away not one single life, killed last year in London 2,000 persons. In other parts of England it has been and is constantly proving largely fatal. And probably five sixths of its victims are children under 10 years of age; who, at least since 1853, under the vaccination law of that year, ought to be effectively vaccinated before they are four months old; but of whom, if they had been thus vaccinated, probably not one would have died of small-pox. There are indeed considerable parts of the country where this scandalous state of things does not prevail; and in order to illustrate how wide a range of difference there is in this respect between different jurisdictional areas in England, I will quote some figures from the very important statistical return which has recently, on Mr. Lowe's motion, been laid before Parliament.* The return contains (with other things) a statement

	Annual Death-rates by Small-pox, per 100,000 living under 5 Years of Age, in the different Registration Districts of England.
In 44 Registration Districts	}
„ 297 „	. . . 1 to 50
„ 131 „	. . . 51 to 100
„ 75 „	. . . 101 to 150
„ 39 „	. . . 151 to 200
„ 24 „	. . . 201 to 250
„ 8 „	. . . 251 to 300
„ 5 „	. . . 301 to 350
„ Shrewsbury	 382
„ Northampton	 456
„ Plymouth	 463
„ Merthyr Tydfil	 572

N.B.—In 72 of the Registration Districts of England the death-rate from all causes of children under 5 years of age is under 4,000, and in 12 of these is under 3,350.

* Return of the average annual Proportion of Deaths from specified Causes, at specified Ages, in England generally, and in each Registration Division and Registration District of England, during the decennial period 1851–60;—Ordered by the House of Commons to be printed, 5th February, 1864:—Sessional Paper, No. 12. And its continuation, No. 12–I., ordered to be printed 4th March, 1864. This return, prepared in the General Register Office, represents part of the statistical work to which I referred by anticipation two years ago (at the close of my Fourth Annual Report) in the following terms: "Eighteen months ago, with their Lordships' authority, I brought under the consideration of the Registrar General that very great help would be given to the progress of sanitary investigation if he (having regard to the then approaching new census of the population, and to the facilities which it would afford for the calculation of accurate death-rates) would cause to be prepared a *digest of all the mortuary returns relating to the intercensual period* 1851–1861, with such distinctions of *age* and *sex*, and such classification of *causes of death*, as would enable the student to estimate, at least with approximate precision, how far each district of England is affected by the several chief sorts of morbific influence. The Registrar General, with his invariable willingness to assist in-

of the respective proportions in which death by small-pox occurred during the 10 years 1851–60 in the 627 different registration districts of England among children under five years of age. The annexed table gives an abstract of that statement. It shows that in 44 of the 627 districts not even a single child had died of small-pox. But, for the remaining 583 districts, it shows results which gradually rise into the evidence of enormous neglect. Indeed, as we descend the column, we find that at last the local death-rates by small-pox represent considerable proportions of what in healthy districts would be the death-rates from all causes, —becoming, for instance, in Shrewsbury more than a ninth part, in Northampton and Plymouth about an eighth part, and in Merthyr Tydfil not less than a sixth part of such a normal death-rate from all causes.

With reference to the 2,000 deaths which there were last year in London from small-pox, I would very particularly refer to the report which Drs. Seaton and Buchanan give of the state of the public vaccination, and to the suggestions which they make for a fundamental change of the present system.

2. *Supply of Vaccine Lymph.*

In the year 1863, 15,383 applications for vaccine lymph were made to the National Vaccine Establishment, and were answered by the sending out of 168,820 charged ivory points, 8,417 charged squares of glass, and 2,127 charged capillary tubes. Particulars as to the sources whence this lymph was supplied to the establishment are given in Appendix No. 5. Of the applications in answer to which lymph was given, 13,221 came from medical practitioners (including 1,540 poor-law medical officers) in England and Wales; 1,171 from Ireland; 414 from Scotland; 277 from the army; 165 from the navy and emigration-department; 65 from colonies; and 70 from diplomatic and other foreign services.

In 1863, as in 1862, my Lords took special means to satisfy themselves as to the undiminished efficiency of the lymph which is supplied under their auspices. Dr. Seaton, whom I under their Lordships' orders had instructed to make this inspection, visited all the stations whence any public lymph supply is derived, and gave an entirely satisfactory report of the quality of the lymph which was in use.

In connexion with this subject, I advert with interest to some information which Dr. Sanderson, while inspecting the vaccination districts of Gloucestershire and Somersetshire, received from local medical practitioners with respect to the present occasional prevalence of natural cowpox in parts of these counties. He is

quiries of this description, resolved to make the suggested compilation. I have reason to believe that it is now in an advanced stage of preparation, and will at no distant period be completed. Ample means will then exist, and be universally accessible, for measuring the amount of mortal injury which different local influences inflict on different sections of our population. In relation to this important object, and in relation to those local inquiries which it is their Lordships' function to make, the value of the promised compilation will be such as to mark a new era for sanitary studies in England."

MEDICAL OFFICER'S REPORT.

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informed, namely, that that infection is still common in the dairy farms of the Bridgewater level and of the vale of Gloucester,—*i.e.*, in the whole of the level country round Bridgewater bay, between the coast and the Mendip and Qwantock hills, and in the whole pastoral country which, from Gloucester to Thornbury, lies between the Severn and the Cotswold hills, having Berkeley (Jenner's birthplace) in its centre. Dr. Sanderson informs me on the subject as follows:—"From statements made to me by practitioners in these districts, it appears that cowpox is usually to be met with in the dairy farms in the months of April, May, and June. When a dairy is invaded, the disease not only infects the whole of the stock, but is very frequently communicated to the milkers—invariably men; on whom the vesicles are seen on those parts of the hand which are applied to the teat in the act of milking, particularly on the grasping surfaces of the thumb and index finger. The inoculating of lymph directly from the cow has been practised in several districts with success. All who have employed such lymph agree in stating that after the first or second transmission the results obtained do not differ from those of ordinary vaccination, either in respect of the progress or character of the vesicle." At the end of Dr. Sanderson's account of his vaccination-inspections will be found his detailed memorandum of the information which he received on the subject.

3. *Educational Vaccinating Stations.*

Of the nineteen stations which are sources of national lymph supply, thirteen are used as educational stations under their Lordships' order of December 1st, 1859, concerning the qualification of contractors for public vaccination. And Dr. Seaton, while inspecting these stations in reference to their stock of lymph, inspected them also in reference to their educational business. In this second respect, as in the former one, his report was entirely satisfactory.

II.—Distribution of Disease in England, and the Circumstances by which it is regulated.

II. Distribution of Disease, and the circumstances by which it is regulated.

For the last five years there has been in progress, under direction of the Privy Council, a systematic and continuous inquiry into the circumstances which regulate the distribution of disease in England.

My report of 1858, "on the preventability of certain kinds of premature death," has served as a programme to the inquiry, and from 1858 till now the results, as far as obtained, have, year by year, been given in my successive annual reports. Sometimes the inquiry has started from known local excesses of a particular disease; and by proceedings in this form the æetiology of several of our most important diseases has been investigated;—as, for instance, of diarrhœa and diphtheria in 1859,—of phthisis and other

lung-diseases in 1860 and 1861,—of diseases causing infantine mortality in 1862,—and of typhoid fever in all the years, but especially in 1869. Sometimes, on the other hand, the form of the proceeding has for convenience been that of investigating the operation of a known morbific influence;—as, for instance, in 1862, in the inquiries into the effects of working with arsenical green, and into the effects of working with phosphorus. During the year 1863 further proceedings of both sorts were ordered by the Privy Council, and considerable additions were in consequence made to the stock of information which their Lordships had previously collected. Inquiry of a third sort,—inquiry, namely, as to the sufficiency with which the primary wants of the body are satisfied among the poorest classes of the population,—has been begun, and in one very important particular (the particular of food) somewhat extensively conducted. I append in extenso the reports of the several gentlemen who have acted as inspectors for those various inquiries of the Privy Council during the year 1863. And I have now to submit some few observations of my own on the several matters of inquiry.

I. *Conditions of Nourishment.*

i. *The Food of the poorer Labouring Classes.*

That no sanitary necessity can be more real than the common animal need of proper food,—that no morbific influence can be of worse import to life than mere privation of nourishment,—these are propositions which everyone feels to be true, when they are illustrated in individual cases of death by starvation, or in those national extreme sufferings of scarcity which constitute famine. But the propositions are not exclusively true in that utmost range of their application. In degrees far short of what is popularly known as starvation or famine, insufficiency of nourishment may bring very hurtful consequences to health. Local defects or local peculiarities of diet may exercise important influence in determining or colouring particular localisations of disease. And generally it may be said, that in order justly to estimate the sanitary circumstances of a people, scientific regard must be had to the quantity and quality of the people's meat and drink.

It was in this point of view that my Lords, in 1863, thought it desirable to order an inquiry to be made into the dietaries of our lowest-fed populations. The inquiry which their Lordships had made in 1862 into the nourishment of the distressed operatives in Cheshire and Lancashire had not only made obvious an existing want of general information with regard to the dietaries of the poor, but had also well shewn the principles on which such information could best be collected and generalized:—and Dr. Edward Smith, who had made that former inquiry for their Lordships, was the gentleman whom under their orders I instructed to make the present more general one.

The inquiry was (like all their Lordships' inquiries) essentially for the purposes of England. But, even for these purposes, some

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exterior standards or comparisons were wanted. And accordingly, just so far as was necessary for that end, information was sought also in Scotland and in Ireland. The number of households visited was, in England and Wales 553, in Scotland 29, in Ireland 52. In 125 cases (all English) the inquiry related to the poorer classes of in-door workpeople,—silk-weavers, needlewomen, glove-stitchers, stocking-weavers, shoemakers, &c., who, almost entirely, were town-residents. In nearly all the remaining 509 cases, the inquiry related to farm-labourers.

This statement of numbers will sufficiently show that the inquiry did not pretend to be exhaustive. Indeed, for obvious reasons, it could but be an examination of *samples;* and in such an examination (exceedingly small, of course, in proportion to the entire mass which has to be judged about) the trustworthiness of the results depends entirely on the degree of success attained in finding samples which are thoroughly typical. Having regard to the dimensions of the inquiry, I cannot venture to say that such success has in every instance been quite perfectly attained; but adverting to the precautions which Dr. Smith took in this respect (and which he describes in the commencement of his report) I feel assured that every selected case may be deemed representative of considerable numbers of families, and that therefore the results of the inquiry may at least be accepted as true for large masses of population.

The results of the inquiry are not so much for any present separate application, as for use, connectedly with other facts, in future sanitary judgments. But while for this reason I may now well leave without comment most of the collected information, there are yet some parts of it to which I would draw attention, as, in my opinion, of more immediate public interest.

As the inquiry specially related to the feeding of our lowest-paid labouring classes, it was to be expected that evidence of very poor diet would often be met with. And such proved to be the fact. Throughout some of the examined classes, and in appreciable sections of the remainder, the diet was (to say the best of it) of doubtful permanent sufficiency for health. For the examined agricultural populations, the diet was not so poor as for the examined in-door operatives. In both classes, of course, poverty was found to tell least upon those who were without families. And in both classes, but very especially among the agriculturists, insufficiency of food does not nearly so much affect the married labourer as it affects his wife and children. For he, in order to do his work, must eat. Particularly if the agricultural labourer be fed at his employer's house, and most of all if he (being unmarried) lives there, he will commonly fare well. Even sometimes, when thus circumstanced, he will feed to excess. But at least the wives and children of the examined agricultural populations, and doubtless, to some extent, even the labourers themselves, are in some counties miserably fed. The

worst deficiencies, however, were found among the examined classes of in-door operatives. They, taken as a whole, are so ill fed that assuredly among them there must be many instances of severe and injurious privation.

Dr. Smith's former report, made at the time when most public alarm was felt for our unemployed operatives in the cotton towns, contained a theoretical estimate of the minimum quantity of food on which human life could reasonably be expected to subsist, and that estimate formed the scientific basis for such advice as was given to the cotton towns on the subject of their allowances for the poor. Its purport was, that, in order to avert starvation-diseases, an average woman's daily food ought to contain at least 3,900 grains of carbon with 180 grains of nitrogen, and an average man's daily food at least 4,800 grains of carbon with 200 grains of nitrogen,—i.e., for the woman about the same quantity of the nutritive elements as is contained in two lbs. of good wheaten bread, and for the man about a ninth part more. Taking the mean of the two allowances, male and female, the estimated weekly need of an average adult would be for at least 28,600 grains of carbon and 1,330 grains of nitrogen. It will be observed (see annexed table) that, in only one of the examined classes of in-door operatives, did the average nitrogen-supply just exceed, while in another it nearly reached, the estimated standard of bare sufficiency, and that in two classes there was defect—in one a very large defect—of both nitrogen and carbon. Moreover, as regards the examined families of the agricultural population, it appeared that more than a fifth were with less than the estimated sufficiency of carbonaceous food, that more than one-third were with less than the estimated sufficiency of nitrogenous food, and that in three counties (Berkshire, Oxfordshire, and Somersetshire) insufficiency of nitrogenous food was the average local diet.

Class.	No. of Families examined.	Average Weekly Supply for each Adult.	
		Carbon.	Nitrogen.
Silkweavers -	42	27,620	1,151
Needlewomen -	31	22,900	950
Kid-glovers -	10	28,623	1,213
Shoemakers -	21	31,709	1,532
Stocking-weavers	21	33,597	1,316
Average -	-	28,876	1,192
Minimum Allowance advised for unemployed Cotton Operatives	-	28,600	1,330

Of course I do not insist on the grains of this comparison. The estimate which serves as the standard for it was, I repeat, a theoretical estimate. Even in that sense it was never deemed more than approximative and provisional; nor could any theoretical estimate be deemed superior to correction from results of actual observation. But, taken for what it is, taken as the scientific, though necessarily imperfect estimate, made only some eighteen months ago, of what quantity of food might on an average just suffice to "avert starvation diseases," it has some significance as

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1. Nourishment.

i. Food of the poorer labouring classes.

a standard. Moreover, at the time when it was made, it had this sort of practical corroboration,—that apparently it agreed very nearly with the very scanty amount of nourishment to which the unemployed operatives under pressure of extreme distress had actually reduced their consumption of food. And now, if averages be looked to, the present empirical results are not inconsistent with it; for, with the mass of examined in-door operatives, where alone the average food consumption of considerable numbers of persons was found below that standard of comparison, the average state of health was unsatisfactory.* To this fact, however, if it stood alone, I should not impute any degree of conclusiveness, as proof of disease resulting solely from scantiness of nourishment. Had the inquiry aimed at the collection of such proof, much larger numbers of extreme cases must have been observed, and minute regard must in each case have been had to details of bodily health, and to other sanitary circumstances than the single influence of diet. That cases are innumerable in which defective diet is the cause or the aggravator of disease, can be affirmed by any one who is conversant with poor-law medical practice, or with the wards and out-patient rooms of hospitals. But the present materials do not pretend to be proof in that particular. They may be regarded as simply expressing the dietetic habits (apart from the sanitary state) of that part of the labouring population which is habitually least above destitution.

Yet in this point of view there is, in my opinion, a very important sanitary context to be added. It must be remembered that privation of food is very reluctantly borne, and that, as a rule, great poorness of diet will only come when other privations have preceded it. Long before insufficiency of diet is a matter of hygienic concern, long before the physiologist would think of counting the grains of nitrogen and carbon which intervene between life and starvation, the household will have been utterly destitute of material comfort:—clothing and fuel will have been even scantier than food,—against inclemencies of weather there will have been no adequate protection,—dwelling space will have been stinted to the degree in which over-crowding produces or increases disease,—of household utensils and furniture there will have been scarcely any,—even cleanliness will have been found costly or difficult, and if there still be self-respectful endeavours to maintain it, every such endeavour will represent additional pangs of hunger. The home, too, will be where shelter can be cheapest bought;—in quarters where commonly there is least fruit of sanitary supervision,—least drainage,—least scavenging,—least suppression of public nuisances,—least, or worst, water supply,—and, if in town, least light and air. Such are the sanitary dangers

* And it must be remembered that Dr. Smith, for reasons which he states at the beginning of his report, made it one of the rules for his selection of sample-families, that the health of the families should, as far as was known, be good. It may be that if this rule had not been acted on, the sanitary complexion of the evidence would have expressed far more privation than it does. But the form of the inquiry must then have been entirely altered, and the main object of the inquiry could not have been equally well attained.

to which poverty is almost certainly exposed, when it is poverty enough to imply scantiness of food. And while the sum of them is of terrible magnitude against life, the mere scantiness of food is in itself of very serious moment. From such degrees of it as Dr. Smith found existing among the lowest fed of the examined classes, there must, I feel assured, be much direct causation of ill-health, and the associated causes of disease must be greatly strengthened by it in their hurtfulness. These are painful reflections, especially when it is remembered that the poverty to which they advert is not the deserved poverty of idleness. In all cases it is the poverty of working populations. Indeed, as regards the in-door operatives, the work which obtains the scanty pittance of food is for the most part excessively prolonged. Yet evidently it is only in a qualified sense that the work can be deemed self-supporting. All disease of such populations, and whatever destitution results from it, must be treated at the public expense; and on a very large scale the nominal self-support can be only a circuit, longer or shorter, to pauperism.

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Also, it seems to me that, where higher degrees of plenty exist, there, very important drawbacks are to be counted. If the wife has been earning money, she has been withdrawn more or less from her housekeeping and motherly duties:—and I must say that, the more knowledge I get of the sanitary circumstances of the poor, the more reason I find for dreading any considerable development of that mode of increasing income. Or, if the children have been earning money, they probably have been more or less withdrawn from opportunities of rudimentary education. In either case (and of course often both cases concur in the life of a single household) a better present livelihood is got;—but the price paid for it *is in* effect a mortgage on the future of the family, —a mortgage which is almost sure to result in the family's eventual deterioration. Particularly I must advert to the lamentable moral (as well as physical) consequences which tend to ensue on various industrial employments of adult women;—a subject which has been in part treated in one of my previous reports,* and will now again be strongly illustrated by facts which I have presently to bring forward.

How far (if at all) the described circumstances of our poorest labouring population tend to better themselves, and how far (if at all) they may be bettered by interference from without, are questions which cannot be discussed without reference to parts of political economy on which I am incompetent to speak. Indirectly, indeed, those questions are of the vastest sanitary importance:—for the "public health" of a country means the health of its masses, and the masses will scarcely be healthy unless, to their very base, they be at least moderately prosperous. And although the satisfactory solution of those questions is a task for other sciences than the science of medicine to fulfil, yet assuredly, if that solution can be given, the ultimate result will be among

* Fourth Report;—pp. 32–35 and pp. 187–196.

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the foremost gains which a department of public health can have to record.

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Meanwhile, however, there are some parts of Dr. Smith's report to which I would particularly refer, as showing how much better is the state of the agricultural population in some parts of the country than in others, and as tending to show what are the favourable influences in determination of such superiority.

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Especially I would advert to the indications which his report contains of the great value of cottage gardens, and to the causes which he assigns for the extensive non-consumption of milk among our agricultural population, and to the remarks which he makes on deferred payment of wages and on disadvantageous allowances of drink. And, in another point of view, I would with equal urgency advert to the considerable differences of economy which there are, and this in town as well as in country, between different poorly nourished households,—to the many illustrations which there are that sensible improvements of the family feeding might be made if but the small economics of diet were understood. Such passages as those to which I refer will show how the poor may most effectively be assisted by others, and how they may most effectively help themselves. Above all, perhaps, it is important that the employers of labour, and the better off classes generally, should understand how many forms of help there are which represent money's worth to the recipient without representing money's loss to the giver. Dr. Smith's report abounds with illustrations of this; and there is one other which I will venture to name. Often the most permanently useful form of help which the better-off classes can afford to the poorest will be the mere imparting of information. For surely the poor man will best succeed in helping himself when he shall have most knowledge appropriate to his circumstances;—not alone when he shall have learnt how to obtain without wasteful purchase or wasteful cookery the fullest vital value for his scanty spendings on food; but perhaps even more, when he shall also have learnt the full economical meaning of the unwholesome and degrading uncleanliness amid which he is now often condemned to live or die,—when he shall have learnt what false thrift there may often be in sending forth wife and untaught children even to bread-winning labour,—and when, with ambition to aim at higher standards of life for himself and for them, he shall be enabled to compare his own local earnings and struggles with those of other sections of the world's proletariat, and in such comparisons shall have the means of judging for himself where is the best market for his special industry, and what are the best terms which, singly or with other men, he can get for it.

In reference to some of these questions, it is of interest to advert to the wide differences of nourishment obtained by agricultural labourers in different parts of the United Kingdom,—differences which are in great part due to actual differences of prosperity, and which in other part are due to differences of an important kind in the dietetic habits of the people. Thus, so

far as the present report furnishes materials for comparison between different parts of England, the food of the agricultural population is in some counties 50 per cent. better than in others. Compare, for instance, in the annexed table, the quantities of the nutritive elements contained in the apparently average dietaries of Northumberland, Westmoreland, Warwickshire, Suffolk, Durham, Berkshire, Oxfordshire, and Somersetshire respectively. The differences here illustrated probably represent, though of course not exactly, differences of labouring prosperity; but the effect of difference of dietetic habit may be shown by comparing with one another the four divisions of the United Kingdom in respect of their agricultural populations. So far as the present materials suffice for the making of such comparisons, it seems that, of the divisions of the United Kingdom, England is considerably the worst fed. A very important difference is, that the agricultural labourer gets in England only a quarter as much milk as in Ireland or Scotland. In Ireland too the bread-stuffs are more than half as much again as in England. And Scotland, which stands lower than Ireland in bread-stuffs, is enabled (thanks in part to its braxy mutton) to exceed Ireland considerably in meat. In Wales there is a third less milk than in Scotland or Ireland, but there is cheese to make up for the difference. And the broad results, stated according to the chemical elements contained in the respective divisional dietaries, are those which the annexed table represents.

Quantities of carbon and nitrogen weekly consumed by an average agricultural adult in the undermentioned counties of England.

Counties for comparison.	Carbon. grs.	Nitrogen. grs.
Northumberland -	48,648	2,034
Westmoreland -	42,149	1,908
Warwickshire -	47,557	1,732
Suffolk - -	47,064	1,744
Durham - -	44,589	1,862
Berkshire - -	37,059	1,193
Oxfordshire - -	35,651	1,322
Somersetshire -	33,832	1,290

Quantities of carbon and nitrogen weekly consumed by an average agricultural adult in each of the four divisions of the United Kingdom.

Divisions of the United Kingdom for comparison.	Carbon. grs.	Nitrogen. grs.
England - -	40,673	1,594
Wales - -	48,354	2,031
Scotland - -	48,980	2,348
Ireland - -	43,366	2,434

ii. *Causes of Sea-Scurvy in the Mercantile Marine.*

To one particular disease of defective nourishment—to the so-called scurvy which results from absence of vegetable food, their Lordships during 1863 thought it expedient to give separate consideration. Their Lordships indeed knew that our general population does not now suffer any appreciable detriment from that entirely preventable and almost entirely prevented disease. But their Lordships also knew that scurvy, notwithstanding its

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entire preventability, is still sometimes to be found, under very censurable circumstances, among a class of persons whom the law purports specially to protect from it. They knew, namely, that to some uncertain extent, and as the result of illegal neglect, it was still occasionally occurring in the Mercantile Marine. And in order that they might have before them all attainable data for estimating the degree to which the evil prevails, I under their direction requested Dr. Robert Barnes, Physician to the Hospital Ship "Dreadnought," to report such information as he had, or could collect, with regard to the prevalence, and the circumstances of prevalence, of scurvy among sailors in the Merchant Service.

Dr. Barnes's report shows that, of the entire number of men received into the Sailors' Home at Poplar, nearly half are, at the time of their admission, suffering more or less from scurvy, and of these perhaps a twentieth part seriously diseased with it;—that, of the entire number of cases admitted during the last twelve years into the Hospital Ship "Dreadnought," cases of scurvy have formed a twenty-fourth part;—that to these must of course be added sufferers who are not taken into such establishments as the above—"a large but uncertain number of cases taken into the low lodging-houses of the water side";—but that this is for London alone, and is not nearly all due to London shipowners;—that, of 86 cases of scurvy treated in the "Dreadnought" during 1863, only 14 came from ships which had issued from the port of London, while 31 came from foreign ships, 21 from Liverpool ships, 8 from Sunderland ships, and 12 from Glasgow and other British ships;—that Liverpool ships, besides furnishing to London a large proportion of the scurvy which is treated here, convey probably a much larger quantity of the disease to their own port of departure,—that, at all events, during 1863, 50 cases (all probably severe) were admitted at the Liverpool hospitals, and during 1862 a dozen cases at the Glasgow and Greenock Hospitals;—that shipowners of Liverpool and other northern ports, and of Hamburg and America, are those who "exhibit the greatest amount of disregard of the safety and health of their crews. The plight in which the poor sailors from certain services are admitted is pitiable to witness. Disabled by hardship, semi-starvation, and ill usage of every kind, they are cast out with the same indifference with which a worn-out block would be thrown overboard."

Apart from the not insignificant question here raised of cruelty from master to servant, there is another question raised by Dr. Barnes as deserving of public consideration. "When it is remembered that the security of this country has on several occasions been imperilled by the disablement of the Royal Navy through scurvy, it may be presumed that the same cause will imperil the safety of our merchant ships. And there can be no doubt that many ships have actually foundered at sea because the crews were so prostrate from scurvy as to be unable to handle them when overtaken by severe weather. It has been the custom to inquire what proportion of the crews

were disabled by scurvy. As might be supposed, in the case of a disease resulting from a cause operating upon the entire crew, this proportion is often very large. Thus there were recently admitted on board the "Dreadnought" 12 cases of severe scurvy from one ship; two others were known to be seriously affected; and the entire complement of officers and men was only 19, leaving but five men in all able for duty to work the ship. Similar cases are not uncommon. It will be seen from Supplement C., that the proportion of the crew disabled has ranged from 20 per cent. to 70 per cent. It is certain that scurvy ships have rarely a hand to spare. Deprive such ships of a fourth, a half, or two-thirds of their force, and the peril of ship, cargo, crew, and passengers in stress of weather is obvious. A crew of five men, for example, could not reef topsails or bring the ship to in a gale of wind. And it must not be forgotten that where scurvy has prostrated a large part of the crew the vigour of the remainder is sure to be sapped, so that there may not remain a single sailor before the mast in a state of thorough efficiency. It cannot be doubted, further, that scurvy, being one result of the recklessness of owners and captains in regard to the health and lives of seamen, is a great cause of demoralisation among sailors. This in itself is a serious evil."

It is unnecessary for me to justify in much detail the assumption with which I started, that scurvy is an entirely preventable disease. Privation of vegetable food is its one essential cause. The giving of vegetable food is its one essential counteractive. This fragment of the science of preventive medicine is now well known to all the world. It was scurvy which used to decimate our navy, and render long sea voyages almost impossible;—it was mainly by scurvy that Anson in his celebrated voyage of 1740–2 lost, within the first 10 months, nearly two-thirds of his crew, and during the remaining period about half of the survivors;—and it was against scurvy that Cook had attained his triumphant success, when in 1775, after three years' absence, he brought back a healthy crew which out of 112 men had lost only one by disease. Cook's great example gradually got to have its due weight. Twice, indeed, in the next 20 years, our Royal Fleet had scurvy enough to endanger its existence. But then the better knowledge and better practice began to make effectual way. The year 1796 was (says Sir Gilbert Blane) marked "as an era in the history of the health of the British Navy," by the general introduction of lemon juice; and an illustration of the effect of this change is that at Haslar Hospital, which even in the year 1780 received 1,457 cases of scurvy, scurvy is now an almost unknown disease.*

* In the middle of the 17th century the deaths by scurvy in London averaged about 30 per annum, but in particular years the average was greatly exceeded. For instance during the years 1655–9 they averaged 86, and in the great plague-year were 105. That amount of land-scurvy, and doubtless a far larger amount in more distant times, depended on the same causes as those which still develop sea-scurvy. Vegetable food was as yet so little cultivated, and the animal food consumed in winter was to so great an extent salt-meat, that perhaps the landsmen of those days

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On what circumstance then does it depend that scurvy, to a noticeable amount, is still found in the Merchant Service? Surely not from ignorance;—for the ships which show how to produce the disease show also how to prevent it;—"Scurvy (says Dr. Barnes) may be prevalent in the forecastle, but it is never known in the cabin; if the captain and mates know how to preserve themselves, they know how to preserve their men."

The one thing wanted in order that scurvy should be entirely banished from the Mercantile Marine, is proper provision for the dietary of the crew;—such provision as is enforced in emigrant ships,—where each person's weekly allowance must have in it at least 8 oz. of preserved potatoes and 3 oz. of other preserved vegetable (carrots, turnips, onions, celery, and mint) besides pickles and 3 oz. of lime juice,—where also there is considerable variety of bread-stuff, and where, on two days of the week, preserved (not salted) meats must be given. With such a dietary as this, the details of which might be varied, provided its principle were adhered to, the occurrence of scurvy would be impossible. And even with dietaries inferior to that just described, scurvy would not occur as it does, if but the provisions of the Merchant Shipping Act (17 & 18 Vict. c. 104.) were obeyed—that whenever a crew shall have been consuming salt provisions for 10 days, lime or lemon juice and sugar shall be served out at the rate of half an ounce each per day,—and if during the voyage the opportunities which offer themselves were fairly used for getting new supplies of fresh animal and vegetable food. But in both respects there is default. Owners disobey the law, and captains neglect opportunities to cure the results of this disobedience. Owners, notwithstanding the law, will send forth their ships on long voyages without any provision of lime juice or with lime juice insufficient in quantity, or with lime juice of which the quality is bad; and "captains, with half their crews more or less disabled, are known to run past St. Helena or the Western Isles when a few hours' delay would obtain sufficient provisions to repair the mischief occasioned by first neglect."

After carefully considering the statements made in Dr. Barnes's report, I concur with him in thinking that the intentions of the Merchant Shipping Act, so far as concerns the prevention of sea-scurvy, are not likely to be altogether realized unless particular inspectional regard be had to breaches of the Act. Probably it might without much inconvenience be arranged that, in every case of the arrival of a ship from a long voyage, the inspecting officer of customs should take means to ascertain whether there be or have been any scurvy on board, and that if thus or otherwise it should appear that scurvy has been prevailing, inquiry under the Merchant Shipping Act should be held whether a punishable offence under that Act had been committed. And assuredly, in

we e no better off than the seamen of these. It is said that the most common articles of the kitchen garden, such as cabbage, were not cultivated in England a century ago, and that in Tudor times Queen Catherine of Arragon could not procure a salad till a gardener came from the Netherlands to raise it for her.

every case of death occurring in this country from sea-scurvy contracted on board ship, it would be desirable that a coroner's inquiry should be made into the circumstances under which the disease had arisen.

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2. *Hurtful or hurtfully-conducted Occupations.*

Employments which injure the health of the employed may be injurious in either of two ways, and may accordingly be considered as divisible into two classes. In the one class, the work is naturally unwholesome, and, except in so far as its natural unwholesomeness can be and is counteracted by artificial contrivances, the employed must suffer in health. In the other class, the work is not naturally injurious to health, but becomes injurious by reason of the mode in which it is carried on. Illustrations from each of these classes have been given in my former reports; and during the past year further illustrations of both have been gathered.

i. Of Workers in Lead and Mercury.

i. As regards the first class of work—the work which *naturally* endangers health,—the inquiries previously made and reported on have related to mining of all sorts, and to the various dust-producing in-door industries, and to the industries concerned respectively with phosphorus and with arsenic-greens;—and now, in continuation, my Lords have had inquiry made by Dr. Whitley into the industries which have to do with LEAD, and into the industries which have to do with MERCURY.

It has long been well known that any person, whose employment brings him into much habitual relation with either of these metals, is liable to a process of slow poisoning; which in its earlier stages seldom (except with extreme neglect) proves dangerous to life; but which, if the employment be persevered in, is apt with time to get faster and faster hold of the body, and at last to cause irreparable disease, usually in some part of the nervous system. Therefore, in their Lordships' investigation, it was a primary object to ascertain as far as possible to what extent lead-poisoning and mercury-poisoning now arise among persons who have most to do with these metals respectively. But unfortunately (for reasons which are set forth in Dr. Whitley's report) full and precise information on this subject could not be got. And any statements which can be founded on my present evidence must be qualified by two considerations;—first, that statistics were never obtainable as to the real pressure of disease on persons employed in the more dangerous branches of the industry; and, secondly, that in all probability the establishments which were visited were very favourable specimens of this class. With these qualifications, the main facts of the case are, I believe, as follows:

a. As regards LEAD,—it seems to be recognized that among operatives who have to do with it only in minor degrees or under mitigating circumstances (as, for instance, among glass-makers, enamellers, shot-makers, printers, and typefounders) poisoning,

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sufficiently severe * to attract notice, is now rare, except for persons of intemperate and uncleanly habits.† Even with plumbers and painters it is not, except by their own fault, much more frequent. In the larger lead industries—the *manufacture of white lead*, and the *manufacture of sugar of lead*, the danger is evidently too great to be entirely within control of personal cleanliness, and perhaps too great to be in any way altogether remediable, while the present processes of manufacture continue. But one of those industries—the manufacture of sugar of lead, is little, if at all, followed in England. And respecting the other (though Dr. Whitley could not get any very exact information on the subject) it seems probable that, except with personal carelessness, damage to life is not often great; that, for all the operatives, scrupulous personal cleanliness greatly diminishes the danger; and that even the most endangered persons—those, namely, whose employment lies in an atmosphere containing considerable quantities of lead-dust, and who get poisoned rather through their mouth than through their skin, might, by the special precaution of using respirators, avert much, perhaps nearly all, of whatever suffering now results from their occupation. Universally it is alleged that progress has been made in diminishing the dangers of the occupation,—progress both in improving the ventilation of workplaces, and in the adoption of personal cleanliness by workpeople; and that, as the result, there has been a great diminution of lead-disease. But in my opinion it deserves more particular consideration than it has yet received, whether the processes which diffuse lead-dust, and which occasion the chief danger of this industry, are not processes which ought to be discontinued or modified.

b. The industries which have much to do with MERCURY are in this country happily but two,—the business of so-called *water-gilding* (a business which tends to be superseded by the innocuous process of electro-plating, and which fortunately even now exists but in small amount) and the far larger business of *mirror-silvering*. In both these industries, but especially in the first-mentioned of them, serious danger to health is, I fear inevitably, involved. But the degree of danger varies, with an unusually extensive range, according to special sanitary circumstances,—becoming enormous when the occupation is pursued in confined ill-ventilated spaces, and when the workpeople neglect personal cleanliness, but under opposite circumstances becoming at least comparatively small. In view of this fact, it is important to observe that water-gilding and mirror-silvering are not carried

*It deserves notice, that among the less prominent effects of chronic lead-poisoning a peculiar liability to *gout* has to be counted. Dr. Garrod's valuable observations, establishing this fact, are not hitherto so commonly known as to have led to any publications of experience with regard to the prevalence of gout among classes of artisans. Nor did Dr. Whitley obtain any important information on the subject. But in Appendix No. 11. it will be seen that Printers, who now most rarely (if ever) suffer from either lead-colic or lead-palsy, are reported by Dr. Smith to speak of gout as comparatively frequent among them.

† I am not able to say whether intemperance has any direct influence in promoting empoisonment by lead, or only acquires the reputation of that influence through the frequency with which it implies careless and uncleanly habits of life.

on exclusively in such large establishments as were visited by their Lordships' inspector, but are to some extent carried on in ordinary dwelling-houses, where, doubtless, if they could be visited, the worst results of mercurial industry might be found.

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Both these metallic industries are, in their hygienic relations, generally comparable to the arsenic-industry of which I spoke in my last report. And the same sort of regulation as I suggested to be desirable for that industry would in my opinion be desirable for these:—viz., that employers should be bound to provide all practicable arrangements for lessening danger to their workpeople, and should be prohibited from employing any person who presents, even in ever so small a degree, any sign of the characteristic metallic poisoning.

2. Industrial diseases.

ii. As regards the second class of industries, the illustrations which stand in my former reports were gathered from the most varied industrial fields;—from the lives of straw-plaiters, lace-makers, and glovers at Berkhampstead, Tring, Towcester, Newport Pagnell, Nottingham, Radford, Basford and Yeovil; from the lives of watch-makers at Coventry; from the lives of button-makers, jewellers and various knick-knack-makers, at Birmingham and Sheffield; from the lives of stocking-makers, especially such of them as work with the old knitting-frames, at Leicester, Nottingham, Radford, Basford and Hinckley; from the lives of pottery-artisans, especially of the decorators of earthenware, at Stoke and Wolstanton; from the lives of factory-operatives employed on cotton, silk, flax, and wool, at Preston, Leeds, Bradford, Pateley Bridge, Macclesfield, Leek, Stroud, Melksham, Coventry and Blackburn, and of operatives, not under the Factory Act, employed at some of these places in particular branches of the same industries.

ii. Of indoor Workers generally.

And the concurrent testimony of these most various illustrations is,—that commonly, when many persons are employed together at any in-door industry, the ventilation of the workplace is likely to be so bad as to convert the employment, which perhaps in its own nature is not of hurtful tendency, into an employment seriously dangerous to health. Here (as I anticipated in my report of 1858) lies the explanation of a fact most deplorable for the working classes of our country,—that, *in proportion as the people of a district are attracted to any collective in-door occupation, in such proportion, other things being equal, the district death-rate by lung-diseases will be increased.* For the bad ventilation which, as a rule, belongs to the place of employment, tends to develop among the workpeople a large excess of phthisis, and probably also some excess of other fatal lung-disease. And probably in all England there is no exception to the rule, that, in every district which has a large in-door industry, the increased mortality of the workpeople is such as to color the death-return of the whole district with a marked excess of lung-disease. The mortuary statistics, recently laid before Parliament, place this matter in a singularly striking light.

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In those returns, for instance, it may be seen, that while about 100 deaths by phthisis and other lung-diseases are occurring in various agricultural districts of England among men aged from 15 to 55, there occur, on similar masses of population, in Coventry 163 such deaths, in Blackburn and Skipton 167, in Congleton and Bradford 168, in Leicester 171, in Leek 182, in Macclesfield 184, in Bolton 190, in Nottingham 192, in Rochdale 193, in Derby 198, in Salford and Ashton-under-Lyme 208, in Leeds 218, in Preston 220, and in Manchester 263.* The same sort of evidence comes out even more strongly, when (as in the annexed table) the statistics are limited to the decenniad of adolescence, and are so given, that, with regard to districts where only one sex pursues indoor industry, the death-rates of the sexes may be compared. There, for instance, it is seen,—and not any one who knows the circumstances under which girls are employed in lace-making and straw-plaiting can wonder at the fact, —that among the adolescent population of Berkhampstead, Newport Pagnell, Towcester and Leighton Buzzard, the female victims of lung-disease are more than twice as numerous as the male. And there again, in the death-rates of Leek, Congleton, and Macclesfield, the same sort of sad testimony is borne (but not exclusively by the female population) as to the atrocious sanitary circumstances under which much of our silk-industry is conducted.

District.	Nature of principal industry pursued in the district.	Death-rates, by phthisis and other lung-diseases, at between 15 and 25 years of age, per 100,000 of each class referred to.	
		Male.	Female.
Berkhampstead, Leighton Buzzard	Extensive female employment in straw-plaiting	219	578
		309	554
Newport Pagnell, Towcester	Extensive female employment in lace-making	301	617
		239	577
Yeovil	Extensive female, with some male, employment in glove-making	280	409
Leek, Congleton, Macclesfield	Extensive employment, more female than male, in silk work	437	856
		566	790
		593	890
Standard Northern Districts	Agriculture	331	333

Thus far, with regard to the indoor-industries which were investigated in 1860 and 1861, and with regard to the new statistical evidence now given as to the unwholesomeness of the circumstances under which those industries are followed. The inquiries of 1863, ordered by my Lords in continuation of the above, related to the sanitary circumstances of three very large London

* In many of these districts, the local industry is to some extent injurious, as one which obliges certain operatives to breathe a dusty atmosphere. But none are such extreme illustrations of that influence as to effect the present applicability of the table.

industries,—that of female *dress-makers*, including in this term not only dress-makers, technically so called, but also milliners and various other workers at articles of dress,—that of *tailors*,—and that of *printers*. The inquiry concerning dress-makers was made by Dr. Ord, the other two inquiries by Dr. Edward Smith.

From these inquiries it appears certain that as regards the ill-ventilatedness of workplaces, the three investigated industries are no exception to the general rule of indoor employment,—that they even furnish in this respect some of the most pitiable illustrations which can be conceived of the cruel sanitary circumstances under which bread may have to be earned.

Probably no industry which has yet been investigated has afforded a worse picture than that which Dr. Smith gives of tailoring:—"Shops vary much in their sanitary conditions, but almost universally are over crowded and ill ventilated, and in a high degree unfavourable to health. Some are found underground, either in the basement of a house, or built like a large kennel in a small enclosed yard, and are such that no domestic servant would inhabit. A very few have been built as workshops for this or some other occupation, and have large rooms, with an abundance of windows. Some consist of a whole house, with the walls on each floor removed, a well staircase occupying the centre, and skylights placed in the roof of the upper room. Others are simply rooms on the upper floors of the premises, and others, still, are single rooms, built in the rear of the premises, and lighted and ventilated from the roof only. In exceedingly few shops have there been any attempts at ventilation, except through the windows placed at the sides or in the roof; but in some, air-bricks have been inserted into the wall, or a tube, with perforated zinc placed in its upper edge, and communicating by the end with the outer air, passes through the room, or tubes of various kinds pass perpendicularly from the floor to the roof. The ventilation through the windows is practically inefficient, since when it occurs only through a moderate opening in the skylights, and the doors are kept shut, the interchange of air is but small, and when through a large opening in the skylight, or through side windows placed near the operatives, the draught cannot be borne, and some of the operatives insist upon them being kept shut. Such rooms are necessarily warm; but when the gas is lit, as during the day-time in foggy days, and at night during the winter, the heat increases to 80° and even to upwards of 90°, causing profuse perspiration, and condensation of vapour upon the panes of glass, so that it runs down in streams or drops from the roof, and the operatives are compelled to keep some windows open, at whatever risk to themselves of taking cold." And he gives the following account of what he found in 16 of the most important West End shops:—"The largest cubic space in these ill-ventilated rooms allowed to each operative and the gaslight is 270 feet, and the least 105 feet, and in the whole average only 156 feet per man. In one room, with a gallery running round it, and lighted only from the roof, from 92 to

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upwards of 100 men are employed, where a large number of gaslights burn, and where the urinals are in the closest proximity, the cubic space does not exceed 150 feet per man. In another room, which can only be called a kennel in a yard, lighted from the roof, and ventilated by a small skylight opening, five to six men work in a space of 112 cubic feet per man. Such a state is, so far as my inquiries have yet extended, without parallel in workshops in other trades."

The state of compositors in printing offices is not commonly so bad as this; nor, still less, that of other printers. And especially I must state that often the master printers have taken pains to amend the ventilation of their workrooms. But from various circumstances the ventilation, even where it has been best devised, is almost invariably unsuccessful;—often because the building is so constructed as to be quite unfit for any large industrial use,—often because the ventilators are so arranged that the compositors are unable to bear the draught of cold air which comes from them,—often because they are inadequate to the great heat and foulness which begin when the gas-jets are lit. Thus, says Dr. Smith, "in one room, with many large ventilators, in which 90 men work, and 167 gaslights burn, the heat becomes almost insufferable . . . The effect of introducing the ventilators has, however, been to lessen the moisture of the air, so that streams of fluid no longer run down the windows or fall from the skylight, and the air has lost its murkiness, even when all the gaslights are in operation . . . It not infrequently happens that fumes from a foundry, or foul odours from machinery or sinks, rise from the lower room; and aggravate the evils of the upper one. The heated air of the lower rooms always tends to heat the upper by warming the floor, and when the rooms are low, and the consumption of gas great, this is a serious evil, and one only surpassed in the case where the steam boilers are placed in the lower room, and supply unwished-for heat to the whole house . . . As a general expression, it may be stated that universally the ventilation is defective, and quite insufficient to remove the heat and the products of the combustion of gas in the evening and during the night, and that in many offices, and particularly in those made from dwelling-houses, the condition is most deplorable. This is partly due to the difficulties of the case, and partly to the determination of the compositor to prevent ventilation. At the same time it must be added that both employer and employed are fully alive to the magnitude of the evil, and wait for science to devise plans whereby good ventilation may be effected under diverse conditions, and in all cases without causing a perceptible draught."

Dress-makers apparently do not, on the whole, suffer so much as printers, nor nearly so much as tailors, from the crowding and ill-ventilation of workrooms;—but the details which are given in Dr. Ord's report show that to a considerable extent (and of course chiefly in establishments of low grade in the industry) the atmosphere in which dress-makers work is, at least during the hours of

artificial lighting, over heated, foul, and unwholesome. Thus for instance, in 34 dress-making establishments (not of the class worked by middle men) Dr. Ord found that the average allowance of cubic feet to each worker was only in four cases more than 500, in four other cases from 400 to 500, in five others from 300 to 400, in five others from 250 to 300, in seven others from 200 to 250, in four others from 150 to 200, and in nine others only from 100 to 150. The largest of these allowances would but be scanty for continuous work, unless the space were thoroughly well ventilated; and, except with extraordinary ventilation, its atmosphere could not be tolerably wholesome during gaslight. The ventilation, however, says Dr. Ord, is as follows:—"In some of the large houses ventilation by special apparatus is carefully attended to; but in the commoner workrooms ventilation is certainly disregarded, and it is not uncommonly found that ventilators, even when provided, are obstructed either wilfully or of neglect. For instance, in one room, occupied by 25 persons, with 150 cubic feet of space for each, and nine gas-jets burning. I found that four ventilators were provided, two, namely, opening into the chimney, and two in the windows. Three of these were useless, one of the window ventilators having a sheet of paper pasted over it, and the two chimney ventilators being immovable. The air of the room was very close and unwholesome; but I was informed that the girls sitting near the windows could not bear the draught, and had therefore stopped up the ventilator. Sitting for many hours without exercise in warm rooms, the girls naturally become extremely sensitive to currents of air, and, in consequence, such obstructions of ventilators are not uncommon. In a low confined room, containing upwards of 30 persons, where ventilating tubes were placed over the gas burners to carry off the products of combustion, I found three tubes out of four purposely blocked up. Even with good ventilation the workrooms tend to become very hot and close at night on account of the number of gas-jets required for the proper lighting up of the work. Where the cubical space for each person is 200 or 250 feet, where a large gas light is provided for every three or four persons, and where the ready access of fresh air is not provided for, the atmosphere becomes very unwholesome. Much illness and deterioration of health among the workers may, in my opinion, be referred to such conditions." And here is Dr. Ord's note concerning an establishment which he visited of the lower or middle-man's class;—"One room, area in cubical feet, 1,280; persons present, 14; area to each, in cubical feet, 91·5. The women here were weary-looking and squalid; their earnings were stated to be 7*s.* to 15*s.* a week, and their tea. The hand who earned only 7*s.* was young and inexperienced. Hours 8 a.m. to 8 p.m. The small room into which these 14 persons were crowded was ill ventilated. There were two moveable windows and a fireplace, but the latter was blocked up, and there was no special ventilation of any kind. This house, in which comfort

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and health were alike ignored, displayed most painfully the evils to which the servants of poor employers are subject."

But this is not all. Besides the sanitary faults of workplaces which the above extracts may illustrate, overwork prevails in all the three industries,—overwork which is systematic, not occasional,—overwork which, with rare exceptions, pervades each industry more or less as its rule,—overwork which, even if the workplace were well ventilated, would of itself suffice to breed disease.

Tailors, in those atrocious workshops which Dr. Smith describes, work generally for about 12 or 13 hours a day, and at some times the work will be continued for 15 or 16 hours. Printers on weekly averages of their labour would be found to spend fewer hours in the workroom;—but their labour is, in very large proportion, night-work, which often is irregularly combined with day-work;—and in some offices (especially those of weekly newspapers) there will be work—work too, in which boys between 12 and 16 years of age take equal part—for almost uninterrupted periods of two days and a night at a time;—while, in other printing offices, which lay themselves out for the doing of "urgent" business, Sunday gives no relaxation to the workman, and his working-days become seven instead of six in every week. The overwork of young women in fashionable dressmaking establishments does not, for more than about four months of the year, prevail in that monstrous degree which has on many occasions excited momentary public surprise and indignation; but for the in-door hands during these months it will, as a rule, be of full 14 hours a day, and will, when there is pressure, be, for days together, of 17 or even 18 hours. At other times of the year the work of the in-doors hands ranges probably from 10 to 14 hours; and uniformly the hours for out-door hands are 12 or 13. For mantle-makers, collar-makers, shirtmakers, and various other classes of needle-workers (including persons who work at the sewing-machine) the hours spent in the common workroom are fewer—generally not more than 10 to 12 hours; but, says Dr. Ord, the regular hours of work are "subject to considerable extension in certain houses at certain times, by the practice of working extra hours for extra pay, and in other houses by the practice of taking work away from houses of business, to be done after hours at home; both practices being, it may be added, often compulsory."*

* Mr. Radcliffe, of Guildford Street, the Honorary Secretary of the Epidemiological Society, has been kind enough to furnish me with some notes and observations of his own relating to milliners and dressmakers employed in first-class houses of business. Happening to have unusual opportunities for questioning the young women when away from business and from the influence of their employers, he has made in a limited number of instances most careful and minute inquiry into the real state of health of girls who called themselves "quite well," and who might be regarded as fairly representative of their class. The result was that in only one out of twenty girls examined could the state of health be pronounced good; the rest exhibiting in various degrees evidences of depressed physical power, nervous exhaustion, and numerous functional disorders thereupon dependent. He attributes these conditions in the first place to the length of the hours of work—the minimum of which he estimates at 12 hours a day out of the season; and secondarily to less universally existing causes,—such as crowding and bad ventilation of workrooms, gas-vapours,

While deeming it my duty to bring prominently forward for consideration these facts which the recent inquiry has made known to their Lordships with regard to the over-work of certain large classes of operatives, I do not in any degree contend, that, in our present social circumstances, the overwork of adult men is a matter for legislative interference. I am aware that, in the judgment of present society, such interference would be beyond the proper province of law,—would be dealing with evils which in the long run will best right themselves without legislature. But that younger persons ought to be protected against extortionate and merciless taskmasters or parents,—that even adult women, at least when collectively employed, ought also to be fenced round with such imperfect protection as law can give them against overwork,—has in principle been affirmed by the legislature. And it may be that, in accordance with the precedents thus already established, some of the cases which I have now brought forward will be deemed fit to be dealt with by law.

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But even more than for the overwork itself, it is for the attendant circumstances of the labour, that now, as in former reports, I would venture to claim particular attention.

In my Fourth Annual Report I showed how practically impossible it is for workpeople to insist upon that which in theory is their first sanitary right,—the right that whatever work their employer assembles them to do, shall, so far as depends upon him, be, at his cost, divested of all needlessly unwholesome circumstances; and I pointed out that, while workpeople are practically unable to exact that sanitary justice for themselves, they also (notwithstanding the presumed intentions of the law) cannot expect any effectual assistance from the appointed administrators of the Nuisances Removal Acts. In the two years which have elapsed since the making of that fourth report, my information on the industries of England has necessarily been increased and extended. And now, with this bettered information, I beg leave to express my opinion that the whole large question of the sanitary circumstances of labour demands very urgently the consideration of the legislature.

Mortality from industrial diseases.

So far as printers, tailors, and dressmakers are concerned, the appendices of my present report contain evidence which will, I

insufficiency or bad quality of food, and inattention to domestic comfort. He insists very much on the ill effects of neglect of domestic comfort,—as in bad cooking of food, monotony of diet, careless or dirty serving of food, scant furnishing of bedrooms, insufficient supply of water, and of accommodation for personal cleanliness, want of arrangements for useful employment of leisure, &c. For remedies, apart from legislative interference, he looks chiefly to publicity; the good effects of which he finds illustrated in the improvements which followed the publication of Mr. Grainger's report. But he points out that the more advanced of the workers, those who in time will become employers, are so accustomed to the existing system, that even if they be not indifferent to its evils, there is little probability that they would, when they possess the power, modify the system to the extent required. And for this, which he holds to be a chief obstacle to thorough measures of amelioration, he believes that a higher grade of education would be the remedy. He would wish to see provided for young women engaged in trade the same facilities for education as are now provided so freely in the metropolis for young men; and he is of opinion that the excellent "Hymes" now existing in London might be the best machinery for bringing that remedy into application.

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think, be deemed sufficient to justify the opinion which I express. And lest the urgency of their case should be undervalued, I here insert a table (for the figures in which I am indebted to the Registrar General) showing the excessive mortality of London printers and London tailors as compared with the healthy standard of agricultural industry. I have no such statistics with regard to dressmakers; nor can I, as regards any special industry, give death-rates calculated like the district death-rates in the last preceding table for the one particular fatality of lung-disease. But Dr. Smith's report tells, both for printers and for tailors, that phthisis and other lung-diseases are notoriously in vast excess. He finds reason to believe that among the printers of London, phthisis, in proportion to other diseases, is twice as prevalent as even among the general male population of London. He finds also that among tailors "consumption and other forms of chest-disease constitute two-thirds of all the causes of death." And the annexed table shows the effect of those diseases in swelling the general death-rate of each occupation. It will be seen that, at the age of 35–45, the mortality of London tailors is 57 per cent. higher, and the mortality of London printers more than 117 per cent. higher, than that of the male agricultural population. It also shows that, at the age of 45–55, the London tailors have nearly twice, and the London printers more than twice, the mortality of the agriculturists.

Number of Persons of all ages employed in the Industries respectively.	Industries to be compared as to their effects on health.	Death-rates per 100,000 men employed in the respective industries at the under-mentioned ages.		
		25–35.	35–45.	45–55.
958,265	Agriculture throughout England and Wales.	743	805	1,145
22,301 men. 12,377 women.	London tailors	958	1,262	2,093
13,803	London printers	894	1,757	2,367

N.B.—It is probable that at the age of 25–35 the mortality of tailors and printers in London is greater than that represented in the first of the above columns of figures. For in both industries, London employers receive from the country large numbers of youths and young adults (probably up to 30 years of age) as apprentices and "improvers." These young men are of course counted in the census as London tailors and London printers respectively. But while their presence thus swells the *number of hands* on which the London industrial death-rates have to be reckoned, it probably does not contribute in anything like the same proportion to the *number of deaths* in London. For the stay of those young men in London is under any circumstances only meant to be temporary; and if, during this time, they are attacked in London by serious chronic disease (such as phthisis) they probably return to their country homes, where, if they die, their deaths would be registered.

This influence affects still more the earlier ages, and renders the London death-rates for those ages quite valueless as measures of the industrial insalubrity. For instance, the death-rate of London tailors at the age 20–25 is represented to be less than that of the agricultural population of the same age, the former being only 715, while the latter is 762. But the fallacy of this representation is seen as soon as we look at the death-rate of tailors at the same age in England and Wales generally, which is 1,113. Similarly, the death-rate of printers generally at the age of 20–25 is 949, while the fallacious death-rate of the London printers at that age is only 698.

In support of the same opinion with regard to other industries, I would refer to the detailed evidence given in my third,

fourth, and fifth reports, and to the overwhelming statistical evidence which has recently been laid before Parliament. Especially I would advert again to the statistics which I have already quoted, with regard to the prevalence of pulmonary disease at our principal seats of textile industry, and in our straw-plaiting, glove-making, hosiery, and lace-making districts. And in further illustration of the case I would submit the annexed table, showing to how deplorable an extent various other industries tend to destroy their workpeople by chronic lung-disease (here usually not phthisical, but irritative and inflammatory) which breaks them down in what should be their prime of life. By this table, namely, the fact is shown that, in the districts where miners and metal-forgers and cutlers and potters follow their respective industries, the death-rate, by lung-disease, of men aged from 45 to 65, is from 2½ to 8 times as high as in healthy agricultural districts.

	Deaths per 100,000 by phthisis and other diseases of the lungs.		Mean of the Two Columns, reduced, for Facility of Comparison, to the Scale of the Standard group, taken as 100.
	Men aged 45–55.	Men aged 55–65.	
REDRUTH - -	1,499	2,360	482½
PENZANCE -	975	1,157	266½
WOLSTANTON -	1,178	1,811	373
STOKE-ON-TRENT - -	1,309	1,787	387
WOLVERHAMPTON	763	1,430	274
BIRMINGHAM -	1,169	1,907	384½
ASTON - -	697	1,290	248¾
SHEFFIELD -	1,205	1,912	389½
REETH - -	1,391	3,214	575½
ALSTON - -	2,069	4,400	808½
ABERGAVENNY -	628	1,305	241½
MERTHYR TYDFIL	898	1,582	310
Standard Northern Districts -	322	477	100

These arguments, taken together, will, I trust, establish my position. Doubtless there may be some small technical difficulty in defining the exact line at which employers shall become subject to regulation. But I would submit that, in principle, the sanitary claim is universal. And in the interest of myriads of labouring men and women, whose lives are now needlessly afflicted and shortened by the infinite physical suffering which their mere employment engenders, I would venture to express my hope, that universally the sanitary circumstances of labour may, at least so far, be brought within appropriate provisions of law, that the effective ventilation of all in-door workplaces may be ensured, and that in every naturally insalubrious occupation the specific health-endangering influence may as far as practicable be reduced.

3. *Residence in Marsh-districts.*

i. As regards Ague and other Malarious Diseases.

Till a comparatively late period in the history of this country, there were vast tracts of marsh-land which could not, without

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3. Marsh-districts.

i. Ague.

much detriment to health, be inhabited. Of course in England marsh-malaria never obtained that desperate malignity which it has in tropical climates. Nor probably was it ever even nearly so fatal as in the southern parts of Europe; where, through its operation, fevers of perilous kinds and very severe dysentery are habitual and general dangers to life; and where even yellow fever, if its infection be introduced, finds a congenial soil for its development. But, though of less formidable intensity here than in those hotter climates, marsh-malaria was a great morbific influence in England. Even in London, till that better draining and paving which after the great fire attended the re-construction of the City, ague used to be among the most prevalent and most fatal of diseases; and now not a century has passed, since it still used to have considerable prevalence in London.* At present, in London proper, it is unknown as an endemic disease. In other parts of England, its cessation has been far slower and less complete. True, that by the Registrar General's reports it appears as causing in all England only from 140 to 240 deaths per annum. But, if one may judge by the records of the Peterborough hospital, where out of nearly 4,000 malarious cases, treated during the last 14 years, only one has proved fatal,—even 140 to 240 annual deaths would represent a very extensive (though not severe) prevalence of the disease. And, moreover, almost certainly those registered deaths from ague are not nearly all the deaths which marsh-disease has occasioned;—for when marsh-malaria destroys life in this climate, almost always it is by secondary, not by primary effects; and the deaths which thus occur are apt to be registered, not as ague-deaths, but as deaths from dropsy, or from liver-disease, or from other abdominal affection.

In 1863 the Lords of the Council thought it desirable to inquire to what extent marsh-disease now ordinarily prevails in the districts which have had the reputation of breeding it. And for the purpose of this inquiry, I under their Lordships' directions instructed Dr. Whitley to visit the principal marsh-districts of England, and to investigate their sanitary state.

* With regard to agues, says Sir Gilbert Blane, in his dissertation on the comparative prevalence and mortality of different diseases in London, "we learn from Dr. Caius or Keye, the most eminent physician in England of that age, that the mortality from agues in London in the year 1558 was such, that the living could hardly bury the dead. And Bishop Burnet, in his history of the Reformation, speaking of the same year, says, 'intermitting fevers were so universal and contagious, that they raged like a plague.' In the next century, we learn from Sydenham and Morton, that intermittent fever was one of the most prevalent of all disorders in London from 1661 to 1665, and that for some years afterwards the complaint was very rare. This was probably owing to the great dryness of the season, effected by draining, when the city was rebuilt after the great fire of 1666. We are told, however, by Sydenham, that these fevers revived before the end of the century, and were epidemic from 1677 to 1685. They prevailed a good deal during the first part of the eighteenth century. The number of deaths reported in the bills in 1728 is 44; in 1729, 47; in 1730, 16; they then greatly declined; but, we learn from a work of Dr. Fothergill, that they returned in an endemic form in the years 1751, 1753, and 1754. For more than 30 years past from the date of writing this [1813] according to my own observation, and the best information I can gather from others, this disease has not been known as an endemic in this metropolis."

The report (App. No. 13.) made by Dr. Whitley is in the main very satisfactory. It records, as regards England generally, that "the diseases which have been made the subject of the present inquiry have been steadily decreasing both in frequency and severity for several years, and this decrease is attributed in very nearly every case mainly to one cause, improved land drainage." Partial exceptions are here and there to be found to this rule of general improvement. "Districts where apparently there has not been in late times much or any lessening of malarious influences, and where consequently all, or nearly all, the improvement has yet to be made, are Huntspill and the marshes on the banks of the river Swale." And, as might be expected from the nature of the case, instances are more numerous where, though improvement has been made, room, even much room, still remains for improvement. Such particularly are the districts of Sheppey, Hoo, Spalding, Hull, New Romney, and Lewes.

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3. Marsh districts.

i. Ague.

Having regard to the serious evil which malaria is in any district, and especially to the harm which in such districts it inflicts on the poorer parts of the agricultural population, I hope that its complete extinction from among us may not be unnecessarily delayed, but that in both classes of districts to which I have referred, and of course peculiarly in the first-mentioned one, the landowners and local authorities will speedily give the furthest proper extension and the fullest possible effect to that system of thorough land-drainage which has already done so much for improving the health of the country.

ii. *As regards the Mortality of Infants.*

After the completion of the above-described general inquiry into the sanitary state of the marsh-districts of England, a partial further inquiry was necessary with regard to the very curious fact (now first made known to their Lordships) that, in some entirely rural marsh-districts, the habitual mortality of young children is almost as great as in the most infanticidal of our factory-towns:—that Wisbeach, for instance, is within a fraction as bad as Manchester;—and that, generally, in the registration districts of Wayland, Thorne, Mutford, Guiltcross, Walsingham, Goole, Spalding, Ely, Docking, Howden, King's Lynn, North Witchford, Yarmouth, Downham, Holbeach, Norwich, Whittlesey, and Hoo, as well as in Wisbeach, the death-rate of infants under one year of age is from 2¼ to nearly 3 times as high as in the sixteen districts of England which have the lowest infantile mortality.

ii. Infant mortality.

Under their Lordships' orders, I instructed Dr. Hunter to inquire into the meaning of this unexpected fact. And now, before adverting to the explanations which he has found for it, and which his report (App. No. 14) fully sets forth, it will be convenient to refer more precisely than I have yet done to the great differences which there are of infantine death-rate in different parts of England, and to the explanations hitherto found for them.

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ii. Infant mortality.

There are in England 16 registration districts, which have, as their mean annual death-rate for infants under one year of age, but 9,085 deaths per 100,000 living; and in one of these districts the death-rate is as low as 7,047. There are 24 districts where the death-rate, though over 10,000, is under 11,000,—39 where, though over 11,000, it is under 12,000,—and 48 where, though over 12,000, it is under 13,000. On the other hand, in 22 districts* it exceeds 20,000. In 25 more districts † it exceeds 21,000. In 17 more districts ‡ it exceeds 22,000. In 11 more districts § it exceeds 23,000. Further, in Hoo, Wolverhampton, Ashton-under-Lyne and Preston it exceeds 24,000, and in Nottingham, Stockport and Bradford, exceeds 25,000; while in Wisbeach and Manchester respectively the death-rates are 26,001 and 26,125.

In my report of 1858 I had stated my belief that the wide differences of infantine death-rate which are to be found in different districts of England (differences which at that time could be but very imperfectly measured) are "due to the varying prevalence of two local causes:—

first, to *differences of degree in common sanitary defects* of residence; some places abounding more than others in the foul air and foul water of undrained, unpaved, unscavenged, unwashed, unlighted, unventilated, localities and houses;

and secondly, to *occupational differences* among the inhabitants; there being certain large towns where women are greatly engaged in branches of industry away from home; where, consequently, the home is ill kept; where the children are little looked after; and where infants who should be at the breast are improperly fed or starved, or have their cries of hunger and distress quieted by those various fatal opiates which are in such request at the centres of our manufacturing industry."

In 1861 an inquiry was made into the second (hitherto the less investigated) of those two causes. It resulted in showing the very extensive and powerful operation of that influence in several of our greatest centres of manufacture. It showed, moreover, that while, with the described circumstances, infants perish under the neglect and mismanagement which their mothers' occupation implies, the mothers become to a grievous extent denaturalized towards their offspring—commonly not troubling themselves much at the death, and even sometimes (it was believed) taking direct measures to ensure it. Now, as regards both classes of infanticidal influences to which I have referred, it had seemed that the great centres of the life-destruction must be

* Westminster, Holborn, St. George, Ampthill, Leighton Buzzard, Luton, Ipswich, Wayland, Docking, Plymouth, Bristol, Stourbridge, Alcester, Barrow-on-Soar, Basford, Halifax, Dewsbury, Thorne, York, Scalcoates, Sunderland, Abergavenny.

† Whitechapel, St. Saviour, St. Olave, Towcester, Northampton, Mutford, Guiltcross, Walsingham, Birmingham, Blaby, Hinckley, Loughborough, Spalding, Hayfield, Wigan, Leigh, Bury, Chorlton, Burnley, Keighley, Hunslet, Barnsley, Goole, Hull, Newcastle.

‡ St. Giles, Biggleswade, Ely, North Witchford, Yarmouth, King's Lynn, Stoke-upon-Trent, Walsall, Dudley, Nuneaton, Macclesfield, Salford, Blackburn, Sheffield, Howden, Merthyr Tydfil, Crickhowell.

§ Whittlesey, Norwich, Downham, Wolstanton, Foleshill, Leicester, Holbeach, Radford, Bolton, Oldham, Leeds.

in towns;—that in towns (or at least amid relatively dense gatherings of population) there would more commonly be found in excess, not only the filth which makes residence unwholesome, but also the collective employments which withdraw mothers from their home. The discovery that an enormous infantine mortality was prevailing in several purely agricultural districts suggested, at first sight, that perhaps in these districts some third sort of destructive influence was at work. And for the solution of this doubt Dr. Hunter's inquiry was ordered.

The result of this new inquiry, however, has been to show that the monstrous infantine death-rate of the examined agricultural districts depends only on the fact that there has been introduced into those districts the influence which has already been recognized as enormously fatal to the infants of manufacturing populations—the influence of the *employment of adult women*. "The opinions (says Dr. Hunter) of about 70 medical practitioners, with those of other gentlemen acquainted with the condition of the poor, were obtained. With wonderful accord the cause of the mortality was traced by nearly all these well-qualified witnesses to the bringing of the land under tillage, that is, to the cause which has banished malaria, and has substituted a fertile though unsightly garden for the winter marshes and summer pastures of 50 or 100 years ago. It was generally thought that the infants no longer received any injury from soil, climate, or malarious influences, but that a more fatal enemy had been introduced by the employment of the mothers in the field." On this agricultural employment of women there follow identically the same results as have already been traced to result from the employment of women in manufacture. The mother, as soon as she can rise from her confinement, goes again to work, leaving, while she is away, her infant to anyone who will pretend to take care of it. Instead of its natural food, entirely improper stuff is given it. "Cow's milk is dear, and often quite unattainable by these people, and sugar sop, a lumpy mass of bread, water, and sugar, is given instead. This is either given cold, or is left on the fire-hob in a cup, seldom or never changed or cleaned, whence the fermented and sooty mass is heaped into the infant's mouth by the nurse, who prefers this mess to cow's milk, under the notion that 'the two milks could never agree'." But this is not the worst. "So-and-so has another baby;—you'll see it wont live," is the neighbourly view which Dr. Hunter finds to be taken of the predictability of certain events among these demoralized populations. And the predicted event soon comes,—perhaps through the normal operation of the diet which Dr. Hunter describes,—perhaps through the almost incredible cruelty of deliberate starvation,—perhaps through an intentional or unintentional over-dose of the opium which is universally employed.* "A medical man is called to the wasting infant, 'because there is so much bother with registering.' The

* Respecting the enormous general consumption of opium in these districts something will be said in another section of this report.

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ii. Infant mortality.

mother says the child is dying, and won't touch food. When *he* offers food, the child is ravenous, and 'fit to tear the spoon to pieces.' On some of the few occasions on which the surgeon in his disgust has insisted on opening the body, the stomach and bowels have been found quite empty. It was in many places reported that infant life had been saved in the midst of one of these wastings by the threats of a determined surgeon or neighbour. Where the coroners have been induced to support these attempts to save life; where inquiry has been made, and severe admonition, with an appearance of a chance of committal; also, where the registrar has pretended to refuse registration without medical certificate in families notorious for their loss of infants,—in these cases an amendment has taken place. It was more than once related, that women who had lost two three successive children lost no more after it had been plainly signified to them that their proceedings were watched. Bad as is the starvation of infants, another practice is more common and more lethal; this is the drugging with opium. . . Cases of death from opium poisoning are supposed to be common; occasionally they are the subject of inquests; sometimes they are recorded as cases of 'overlying;' but the medical practitioners are of opinion that by far the most common end of such cases is the simple registration and burial as cases of '*Debility from birth, no medical attendant*,' '*Premature birth*,' and such like;—the public opinion of the neighbours seldom going beyond a sneer or sarcasm on the occurrence of a quarrel months or years after. So perfectly did the main body of medical practitioners agree in the opinion that 'ablactation and narcotism' would be the true description of the cause of death of more than half the infants recorded, that a list of their names seems to be all that is necessary to be added." And Dr. Hunter adds the list of the 67 medical witnesses from whom the information was derived.

Even as compared with factory-labour, the female agricultural labour of the marsh-districts shows some very bad features. It is (as Dr. Hunter describes) often migratory,—the women often travelling in "gangs" under charge of an "undertaker," who contracts for them; and, under this system, neglect of infants must of course be as great as possible. The system, moreover, conduces to a vast quantity of reckless fornication. The proportion of illegitimate births is extraordinarily great. And perhaps the darkest shades of Dr. Hunter's picture are for cases where the infant's burthensomeness to its mother is increased by this complication of illegitimacy. The illegitimate births, he says, "frequently occur in the workhouse, and here, until the child is taken out, it thrives as well as others, but within a few weeks after their discharge the mother will go to the registrar, to inform him that her child is dead, and that it was always weakly, and never 'likely for life.' The lawful child fares little better when the mother belongs to a gang, or even does ordinary field work in her own parish. In the agricultural population it may be roundly stated that

of the illegitimates one third die under a year old, of the others one fourth part. Then it must be remembered that in the latter class, who form nine tenths of the births, are found nearly all those of people whose comfortable circumstances allow them to give proper time to nursing their children."

In concluding this very sad recountal of evils, for which I cannot suggest any effectual remedy, I will observe that my knowledge of such evils may excuse the profound misgiving with which I regard any large industrial employment of adult women.

4.—Hospital Hygiene, especially in relation to the so-called traumatic infections, and to the spread of contagious fevers.

Early in 1863, pursuant to the programme of sanitary investigation which I had sketched in my report of 1858, I submitted to the Lords of the Council that among the subjects which were now next claiming to be investigated was that of the influence of sanitary conditions on the curative efficiency of hospitals.

Besides the general reasons, suggested in 1858, for the making of such an inquiry, there had recently arisen a very striking illustration how much the inquiry was needed. The displacement of St. Thomas's Hospital from the site which it had for six centuries occupied at the south end of London Bridge gave rise very properly to much public discussion as to the rules by which the governors of that important charity ought to be guided in their choice of a new site for the hospital. And in the course of this discussion it became evident that the opinions expressed with regard to the relative importance of different sanitary circumstances in determining the salubrity of hospitals, were not directly deduced from a comparison of hospital experiences, but were inferences (right or wrong) from cases of supposed analogy, and that not on either side were there means for comparing in any useful way the success of one hospital with the success of another.* It was indeed scarcely to be hoped that the results of any inquiry

* I personally felt, that if the governors of the hospital had appealed to the Privy Council for information in the matter, I could not have submitted to their Lordships any credible existing documents on these subjects. And when it devolved upon me, as one of the surgeons of St. Thomas's, to take part with my colleagues in advising the governors whether town or country should be preferred for the new hospital-site, I could not import into our consultation any arguments but from analogy. The terms in which the physicians and surgeons (including myself) finally advised, were, as regards the said point, these:—"Supposing two otherwise thoroughly well-conditioned hospitals—one in London, the other in the country,—some of us believe, while others of us do not believe, that, in the results of medical and surgical treatment, the country hospital would have an appreciable superiority of success. If, however, we in this respect for argument's sake adopted, as though it were unanimous, the most sanguine belief which any one of our number entertains, our practical conclusion [that St. Thomas's Hospital ought not to be moved into the country] would be unchanged:—for unanimously we should be of opinion, that the advantages of the country hospital would be purchased at far too dear a price, when, in obtaining them, the hospital must be made inaccessible to the sufferers who most urgently require it, and when the present system of professional attendance must be changed in essential particulars." To this expression of opinion were added some suggestions as to special arrangements which are suitable for convalescents and chronic invalids.

II. Distribution of Disease, and the circumstances by which it is regulated.

4. Hospital Statistics and Hospital Hygiene.

which their Lordships might order could be of public use with regard to the apparently almost settled question of the site of St. Thomas's Hospital. But whether the collectable evidence could or could not be made to assist public judgment in that particular question, the need for the inquiry in relation to future like questions which might arise was too evident to be resisted. And moved by these considerations, my Lords, at the beginning of the financial year, ordered that during the remaining nine months of 1863 there should be made, on as large a scale as the time would permit, a medical and surgical inquiry into the sanitary circumstances and results of British hospital practice.

The two gentlemen whom, under their Lordships' orders, I instructed to make the inquiry, were Dr. Bristowe, Physician to St. Thomas's Hospital (who had already made various sanitary inquiries for the department) and Mr. Holmes, Surgeon to the hospital for Sick Children, and assistant surgeon to St. George's Hospital. To these gentlemen the object of the inquiry was proposed in the following terms:—"*to ascertain the influence of different sanitary circumstances in determining in different hospitals (as compared with one another, and where practicable with private practice) more or less successful results for medical and surgical treatment;—particularly among patients who are submitted to surgical operations, or have undergone accidental injuries, and among patients suffering from infectious fevers and other kinds of acute disease, and among puerperal women;—and with particular reference to the different degrees in which recovery is delayed or prevented by accidental morbid complications.*"

For attainment of the object thus proposed to them, Dr. Bristowe and Mr. Holmes, or one of them acting for both, visited in succession almost every considerable civil hospital in England and Scotland, and all the more important hospitals of Ireland. Receiving always kind co-operation and welcome from the authorities and officers of the hospitals which they visited, they endeavoured in each separate case to gather the fullest information which minute local inquiry and observation could elicit,—first, as to all sanitary circumstances of the hospital sick,—and secondly, as to the practical effect of the circumstances. Further, when these inspections were drawing to an end, the inquirers represented to me that the correctness of some of the conclusions to which they were tending could not well be tested, except by adverting to the experience of a hospital system differing very considerably from our own, and that, for the purpose of thus checking the results and increasing the trustworthiness of their report on British hospitals, they would wish to be authorized to collect some evidence with regard to the hospitals of Paris. My Lords having sanctioned this proposed supplemental inquiry, an inspection was made of the chief Parisian hospitals and of their records; and the very short time which could alone be afforded for its prosecution was rendered in effect sufficient, by official help, which I am bound gratefully to acknowledge, from M. Husson, the distinguished director of the department of public assistance

in Paris, and from Messrs. Blondel and Ser, two of the sanitary officers of that department.

In submitting the report (Appendix No. 15) which Dr. Bristowe and Mr. Holmes have made on the subject of their inquiry, I may permit myself to say, that in my opinion it gives a singularly comprehensive picture, and (so far as circumstances permit) a substantially just relative appreciation of the present hospital system of this country. It is true that, from causes entirely beyond the reporters' control, the report must be regarded rather as introductory than as final in its subject; for data could not be found for completely answering the pathological question which was proposed. In the vast majority of hospitals no scientific records were kept; and in the rare instances where reasonably good records were seen, these, as kept at different hospitals, were commonly so unlike one another, that no exact or minute comparison between them could be made. But though on this account the present report cannot be deemed exhaustive of its subject, and though especially there must remain for future inquiries many of the more subtle questions which the pathologist is anxious to see solved, yet, for practical purposes, the information now submitted will, I believe, importantly assist public judgment as to all broad rules of hospital hygiene.

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In introduction to the report, I purpose here to say something as to the nature of the difficulties with which hospital managers have to contend, and as to the materials from which judgment may be formed concerning the skill with which that contest is conducted. From the nature of the case, my discussion of these subjects must be of an entirely technical character. In proceeding to it, I have to premise that, except where otherwise expressed, I speak only of general hospitals, and only of their in-patient practice.

I begin by interposing a caution (which is not, though perhaps it ought to be, superfluous) against one particular ambiguity of words in the discussion. What is the sense in which the word "healthy" may properly be applied to a hospital? In order that a hospital shall deserve to be called "healthy," we evidently do not require that its inmates shall be persons in health; for, to an establishment thus tenanted, the name "hospital" does not belong. Nor (it follows) do we require that the inmates of a hospital, as compared with corresponding numbers of healthy outside population, shall not suffer a high—even a very high—death-rate; for, since the hospital population is altogether a sick population, we expect that, in proportion to the gravity of the population's sickness, the hospital death-rate will exceed (perhaps, therefore, will very greatly exceed) the death-rate which, for a corresponding healthy population, would be normal. A "healthy" hospital is a hospital which does not, *by any fault of its own*, aggravate ever so little the sickness, nor oppose ever so little the recovery, of

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persons who are properly its inmates. And this, the only right sense of the absolute word, governs of course the word's comparative applications;—so that, when we compare together two hospitals with regard to their "healthiness," and call one of them the "unhealthier" hospital, our meaning is, that in this hospital, by reason of some fault of its own, disease cannot be treated as successfully as in the other hospital. And the "fault of its own" through which an "unhealthy" hospital fails to attain the best possible results for its medical and surgical treatment, is of one of two kinds:—either it is an *inherent fault*, as of site or construction; or else it is *fault of keeping*, as dirtiness, or over-crowding, or neglect of ventilation.

Evidently it is of the utmost consequence that hospital authorities, for their own administrative guidance, should be able to compare together the results which their respective hospitals attain. How then may this be done?

Of all the various forms in which medical or surgical unsuccess may become evident, DEATH is the most unquestionable; and if proper materials existed for the purpose, hospitals might well be compared with each other, in regard of their respective quantities of that particular sort of unsuccess. But in order that such comparisons may be something better than mere arithmetical idleness, it is essential that there be no error as to the principle on which the death-rates are to be estimated. Death-rates calculated on *given magnitudes of illness* * are (as far as they go) true measures of medical or surgical unsuccess. But a definite magnitude of illness is not necessarily represented by any given number of patients taken indiscriminately. Magnitude of illness (as regards the number of deaths which are likely to result) may be almost infinitely greater in one set of patients than in another equally numerous set;—e.g., among a hundred inmates of the Fever Hospital, Islington, as compared with a hundred inmates of the Ophthalmic Hospital at Moorfields;—or among a hundred patients having advanced phthisis, or advanced Bright's disease, as compared with a hundred patients having hysteria, or ringworm, or chronic rheumatism. And unless due regard be had to this vastly uncertain import of the word "patient," death-rates, calculated on mere numbers of so-called patients, must be utterly worthless as measures of hospital unsuccess.

This consideration is of very great importance as regards any use to be made of the so-called "general death-rates" of general hospitals.† In the present state of knowledge it would be impossible that general death-rates should be calculated on exact estimates of the aggregate magnitude of illness treated in each hospital respectively. They may indeed be calculated on the other principle, calculated on the mere quantity, apart from the quality, of each particular

* For brevity, I use this expression, to signify the compound result of *number* and *quality* of cases.

† General death-rates are sometimes calculated on the *mean daily sick population* of a hospital; sometimes on the *aggregate number of cases treated*, during the year or other given time, *to a termination*. There are, I think, good reasons for preferring the latter mode. *See* note subjoined to the table at page 43.

hospital practice. But, when thus calculated, what pathological value can they have? For comparatively measuring hospital unsuccess, as against equal magnitudes of disease, they are utterly, even absurdly, inadmissible. Such could only be their meaning if it were first assumed that all the compared hospitals receive cases of equal (or not importantly unequal) gravity and dangerousness to life. But this assumption would be grossly inconsistent with facts. Hospitals, with regard to the quality of cases received in them for treatment, differ not triflingly, but enormously, from one another. Not only does it constantly happen that local circumstances tend to fill some hospitals rather than others with an excess of severe and dangerous cases, but different hospitals act on widely different principles as regards their reception of patients. While some charities recognise no other priority of claim to admission tha that which consists in more severe and more urgent illness,—whil they evince noble pride and emulation in waging an ever pre carious contest against the least conquerable forms of disease,—an while they, thus competing with one another for the difficulties an dangers of practice, have the dying and even the dead brought numbers to their receiving rooms,* and have their death-lis swollen by the many defeats which their more arduous practi involves—defeats, however, against which there are correspondin victories and triumphs to be counted,—other hospitals pursue s different a course that their death-rates may well be low. L the generous system which is followed at our chief urban hospital our great schools of medicine and surgery, or let the even bette system which is followed at the hospitals of Paris, be compare with such a picture as that which the reporters draw of the syste of our English rural hospitals:—"The functions which in Par are exercised by the hospitals in the treatment of acute disea are discharged in the country districts of England by the medic officers of the poor law unions, and of the clubs, and the ho pitals are reserved for the chronic cases. In many count hospitals the beds are taken for some time beforehand; many the subscribers would not think they obtained fair value f their subscription unless their nominee was admitted, howev little prospect there might be of his receiving more benefit t treatment at the hospital than at home; and not only admitte but kept for the full 'term,' as it is called, that is to say, the tim during which a letter is good.† The consequence is, and mu be, that the hospital is looked upon amongst the poor as a privat charity, as far as *disease* is concerned, and admission into it sought through private channels, just as into an almshouse; in fa these country hospitals have become in great measure sick club

* E.g.,—at St. Bartholomew's Hospital in 1863, 94 patients died within a day aft admission, and 26 were brought dead to the hospital. The total deaths of the ye were 557.

† "This is usually either six weeks or two months. After that time the patient, he is to stay, requires another letter.... A curious illustration of the effect of the lett system upon the supply of patients is furnished by one of the hospitals which we hav visited, where the hospital is moderately full while the governors have a good stoc of letters, but becomes half empty at the season of the year when their stocks of lette are becoming low. This shows how little the practice of such hospitals correspon to the real wants of the population."

in which the employer pays instead of the patient. *Accidents* are known to be freely received, and are consequently always taken to the hospital; but we believe we are right in saying that, at hospitals of the purely 'country' class, urgent medical cases never present themselves, except on the day of the weekly admission, and then very rarely. Such a hospital, therefore, usually contains a few grave accidents, and a still smaller number of cases requiring surgical operation, amongst a much larger number of chronic invalids, who have little more influence on the sanitary condition, or on the atmosphere of the hospital, than if they were in a condition of health: very few of the patients are in any danger of speedy death, and of those who are gradually sinking from visceral disease a great part prefer to go home, when they find that they can expect no benefit from treatment, or feel themselves near their death. Another effect of this strict adherence to the letter system is that the hospital is seldom, if ever, full; and that the daily average of patients is very greatly below the number of beds.* . . . It is no exaggeration to say that a large proportion of those who are under treatment in our country infirmaries might be treated with as much success at home, while the victims of acute disease are left to be attended in their own squalid houses by the overworked officers of the club or the parish."

These extreme differences of hospital system must directly involve corresponding large differences of hospital mortality. For easy and difficult tasks are not executed with equal quantities of success. But differences of death-rate thus occasioned are not facts of which the high-rated hospitals have any reason to be ashamed, or on which the low-rated hospitals can congratulate themselves.†

The utter inutility of general death-rates as measures of hospital healthiness may be illustrated by reference to some curious little tables which the Registrar General has published at page 205 of his 24th Annual Report. The late Census having shown how many special inmates were, on April 8th, 1861, contained in each of the hospitals of England, and the common mortuary returns of the year 1861 having shown how many deaths had in that year happened in each of the hospitals of England, the Registrar General reckoned from these materials a *general death-rate per hundred occupied beds* [which death-rate, in order to distinguish it from death-rates calculated on other principles, I will call the *bed death-rate*] for each of several hospitals and groups of hospitals

* The table on page 569 shows, that out of 4,092 beds made up in the rural hospitals there referred to, only 2,813 were occupied at the time of the inspection.

† Even with respect to two general hospitals, situated, as were Guy's and the old St. Thomas's, side by side in the same district, and having much similarity of constitution, no cautious reasoner would assume without certain knowledge that the two practices are of identical quality,—that a given large number of patients treated in the one hospital represents the same magnitude of illness as the same number of patients treated in the other hospital,—and that consequently any existing difference of death-rate between the two hospitals represents (in the proper sense of the words) a difference of hospital success. Indeed, as regards the two hospitals which I have particularly named, I have reason to know that, at least for some periods of time, such an argument would have been fallacious. And if the comparison would not be strictly unobjectionable even for that peculiar case, to what objections must it not be open when applied to hospital systems so different as those described in the text?

in England. Those bed death-rates—as being calculated, not on mean daily sick population, but only on the accidental inmatage of a single day—cannot be more than approximative to true bed death-rates; and bed death-rates generally, by reason of the principle on which they are reckoned, are, in my opinion, for any hygienic argument, of all general death-rates the most fallacious*; —but both these objections to the Registrar General's bed death-rates are so trifling, when compared with the objections which I have stated in common against all general death-rates as measures of hospital healthiness, that I need not refrain from quoting the Registrar General's rates in illustration of my present argument. I accordingly annex a selection from them;

Classification of Hospitals, according to their respective Sites and Sizes.	Actual or Average Number of Special Inmates in each Hospital on April 8th, 1861.	Estimated Bed Death-rate for the Year 1861.
24 London Hospitals	176	90·84
12 Hospitals in large towns	156	83·16
25 County and important Provincial Hospitals	90	39·41
Hospitals in large Towns.		
Bristol Royal Infirmary	224	56·25
Birmingham Queen's Hospital	135	58·52
Nottingham General Hospital	137	40·88
Liverpool Northern Hospital	101	128·71
Manchester Royal Infirmary	202	130·69
County and important Provincial Hospitals.		
Brighton, Sussex County Hospital	109	66·06
Headington, Oxon, Radcliffe Infirmary	133	24·81
Dorchester County Hospital	50	24·00
Devon and Exeter Hospital	181	25·41
Bath United Hospital	78	102·56
Leicester Infirmary	83	61·45
Swansea Infirmary	80	10·00

N.B.—With reference to the *bed death-rates* given in the last column, it must be remembered that each bed receives during the year a succession of patients. A *bed death-rate* of 100 per cent. per annum means that in the course of the year there occurs on an average one death in every occupied bed of the hospital. The better principle on which to calculate general death-rates, for any little purpose which they can answer, is that of calculating them on the *aggregate number of cases treated* during a year or any other given time *to a termination*. This for distinction, may be called the *patient death-rate*. There is no necessary correspondence between such a range of *bed death-rates* as is shown above in the last column, and the range of *patient death-rates* for the same hospitals and groups of hospitals. Whether the two ranges would correspond or not, depends on whether the mean staying-time of patients is the same in all the hospitals and groups of hospitals compared. It is certain that this is not the case. The frequency of succession of patients (or, in other words, the mean staying-time of each) varies greatly in different hospitals; partly according to the size of the hospital in proportion to the number of applicants, partly according to the degree in which the hospital receives cases of acute disease. With knowledge of the mean stay of patients in hospitals, *bed death-rates* may at once be converted into *patient death-rates*, or vice versâ.

* *See* note subjoined to the table. In both respects, their inconclusiveness may be illustrated by quoting the death-rates of a special hospital. Dr. Buchanan, one of the physicians of the London Fever Hospital, shows me that the bed death-rate of that hospital, calculated with reference to the number of special inmates who were in hospital on April 8th, 1861, was in 1860 nearly 300 per cent., in 1861 nearly 500 per cent., in 1862 nearly 2,000 per cent., and in 1863 nearly 1,400 per cent.

partly to show how suspiciously great a range of death-rates there is among hospitals which are grouped as congeneric, and still more to show the very striking disparity of death-rates which there is between the groups when treated as wholes. Among the large-town hospitals, for instance, the Nottingham has a death-rate under 41, while the Manchester has a death-rate over 130; and among the minor hospitals, the Swansea has a death-rate of but 10, while the Bath has a death-rate of 102. But more importance might seem to attach to the comparison which is suggested in the first three lines of the table. It is within the mark to say that, according to those figures, the death-rate of the large general hospitals of large towns is twice as great as the death-rates of small hospitals in small towns; and partially informed persons reading this statement might easily imagine that the figures contain a most important hygienic lesson for hospital administrators. Nothing, however, could be farther from the truth. The figures—whatever other value they may have, are absolutely without intelligible relation to any question of hospital hygiene. For when read with such explanations as I have given (including these which are subjoined to the table) they are at once seen to be susceptible of widely different interpretations. They may be supposed, for instance, to justify any one of the three following conclusions:—(1.) That the urban hospitals *change their sick population twice as often* as the rural hospitals, and that other conditions are equal; or (2) that in the urban hospitals *the mean gravity of cases received for treatment is twice as great* as in the rural hospitals, and that other conditions are equal; or (3) that in the urban hospitals the *success of treatment of given magnitudes of disease is half as great* as in the rural hospitals, and that other conditions are equal.* These conclusions

* That the last stated of those three conclusions would be untrue, and that the ambiguous differences of general death-rate shown in the Registrar General's tables are in fact mainly dependent on such influences as are adverted to in the first and second conclusions, will assuredly not be questioned by any one who carefully considers the evidence which Dr. Bristowe and Mr. Holmes have collected. It is therefore in my opinion very much to be regretted that, in oversight of the real facts of the case, some readers should have interpreted the Registrar General's statistics in the sense which they least properly bear, should have insisted on their being viewed as inculpatory of our great urban hospitals, and should in quoting them have levelled against the most useful of our medical charities imputations which (to say the least of them) that evidence will not justify. For instance, in the last edition of Miss Nightingale's often admirable *Notes on Hospitals*, material from the Registrar General's report is quoted to show that the general death-rates of English Hospitals range as in the above table, and the inference is suggested that these different death-rates correspond to different degrees of "healthiness" and "unhealthiness" in the several kinds of hospitals respectively. And Dr. William Farr, adverting to this subject, in a letter recently written to the Medical Times and Gazette, and published in that journal on the 13th February last, gives the world to understand, as apparently his opinion, that general hospitals, by reason of "defects" which "render them ways of death to their inmates," do not "benefit mankind directly," but "merely" as "pathological observatories and medical schools." It is fortunate that the subjoined report can relieve the medical profession and the public from the very painful but false impressions which Dr. Farr's language, while uncorrected, tends to create. The figures on which he relies show that during the year 1861, in proportion to the number of patients who were under treatment in the respective hospitals on the 8th April in that year, the hospitals in our largest towns had much more to do with dangerous forms of illness than the hospitals of country districts. But to conclude that

(it is scarcely needful to say) are not compatible with one another. But the special influences named in the first and second of them are in practice so likely to concur, that a fourth conclusion affirming the joint action of those two influences is perhaps more plausible than either the first or second, and may, for argument's sake, be taken instead of them. It will then be seen that this conclusion, like the two out of which it is compounded, is essentially opposed to the third conclusion. The one would affirm, while the other would deny, a true difference of hospital success. But to decide between those very two propositions is, in any argument concerning the hygiene of hospitals, the only object of the discussion. Evidently, then, those general death-rates cannot, except by petitio principii, be deemed at all applicable to the purpose. Nor can any such use be made of them till other information mediate in the matter, and convert them (should this ever be possible) into general death-rates proportionate to fixed magnitudes of disease.

It follows, I think, from the preceding observations, that, if hospitals are to be compared for any useful purpose, they must be compared in very considerable detail. The kind of question which has *to* be answered, with regard to any two compared hospitals or groups of hospitals, is *this*;—*what are* the average rates of *death* (or what are the average times spent in recovery) among *cases of like nature* treated in each hospital respectively? And when I say "cases of like nature," I do not mean cases which popularly pass under like names, but cases scientifically grouped according to whatever important difference they have among themselves in regard of their chances of recovery. Thus, as regards surgical practice, a very important category of comparison would be that of "death-rates after amputation;"—but the natural danger of an amputation varies according to several circumstances,—e.g., according to the magnitude of the amputated part, and according to the age of the patient, and according to whether the amputation be done for a chronic disease, or for an acute disease, or for the immediate effects of injury, or for the remote effects of injury, and according to whether the disease or injury affects other (especially internal) parts of the body;—so that the amputation-success of one hospital cannot properly be compared with the amputation-success of another hospital,

the greater magnitude of illness in the town hospitals was a product of hospital-insalubrity, is as though one should conclude that the greater number of broken legs in a town hospital had been broken by some hospital-agency. And to argue that hospitals are "unhealthy" in proportion to the number of deaths which occur in them, is as though one should argue that bedrooms are proved to be unhealthier than dining rooms, because more people die in bed than at table. Infinitely nearer to truth in these matters were the opinions expressed fifty years ago by that very able sanitary writer, Sir Gilbert Blane, when (*in his* paper on the prevalence of different diseases in London—a paper which I have more than once quoted in the course of my present report) he observed, as follows:—"The comparative mortality of different hospitals is a most fallacious test of the success of practice unless the nature and intensity of the several diseases are taken into account. A large mortality may even be considered as a presumption of an hospital being well conducted, in as far as it indicates that the most severe disorders had been admitted, or, in other words, that the most judicious selection of cases had been made." Med. Chi. Transact. 1813, p. 117.

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unless the amputations be divided into classes corresponding to those different degrees of danger;—nor can a sufficient classification of cases be made unless all major amputations be registered with at least as much detail as I provide for in the annexed form.

A second very important category of surgical comparison would be that of "death-rates after lithotomy;"—but lithotomy (skilfully performed, where there is no recognizable disease of kidney nor advanced disease of bladder) has its death-rate so predominantly governed by the ages of the lithotomized patients, that, unless the patients be classified according to age, no useful comparison of lithotomy successes can be made.

Of course, with respect to either of the above kinds of comparisons, if two compared hospitals or groups of hospitals were quite similarly circumstanced, and if the comparison were on a sufficiently large scale, it might be assumed as probable that the *omnium* of major amputations in one hospital would contain about the same mixture of cases as the *omnium* of major amputations at another hospital, and similarly with the *omnium* of lithotomies. But extreme caution is requisite not to make this assumption improperly;—for, as regards both operations adverted to, the *scale of natural danger* due to such influences as I have named has a far larger range than the *scale of artificial danger* which it would be the comparer's object to discover; and with any careless

Account of terminated Cases in which Amputation was performed in . . . . Hospital, during the Year . . . .

Patient.	Circumstances of Amputation.					The Operation.		Result of the Operation.					Explanatory Remarks on Circumstances which influenced the Result.	Notes by which, if desired, the Patient's Ward and Surgeon can be identified.
								If Death.		If Discharge.				
Sex, Age, and all General Sanitary Antecedents.*	Nature of the Disease or Accident for which the Amputation was performed.	Date when the Disease began, or the Accident occurred.	Date of Patient's Admission to Hospital.	Date of Amputation.	Whether at the Time of Operation other Disease or Injury existing, and if so, what.	Part amputated.	Method of Amputation.	Date of Death.	Cause of Death.	Date of Discharge.	Whether Wound fully healed.	Whether Health fully restored.		

* In order to save space I have used in my form the expression "general sanitary antecedents" to represent such headings as *occupation, residence, habits, ordinary health*. Perhaps these ought to have separate columns to themselves; for, under each of them, something might have to be noted which would mark the case strikingly as exceptional to the common run of cases.

assumption that unexamined circumstances are equal, very large fallacies may creep into well-meant comparisons. When, for instance, it is seen that, according to Mr. Teale's analysis of 679 cases of amputation of the thigh or leg, the death-rate of amputations for injury is twice as great as the death-rate of amputations for disease,—or when it is seen (as in the annexed table) that Cheselden's lithotomical unsuccess was about fifteen times as great among patients over 50 years of age as it was among patients under 10 years of age,—it will be obvious that, in any aggregate comparison of amputation-successes or lithotomy-successes, great apparent superiority on one side might be due to the fact that on that side a larger proportion of the amputations had been for disease, or a larger proportion of the lithotomies had been of children; and it will follow that, even where such aggregate comparisons are between hospitals quite similarly circumstanced, any *omnium* of cases which is meant to exclude even approximately such sources of fallacy as I have indicated must be of exceedingly large dimensions. So again, as regards physicians' practice, the "death-rates of fever-cases" would be entirely valueless for comparison unless the fever-cases were distinguished according to their respective kinds,—*typhoid, typhus, relapsing*, &c.; for, of the three best defined kinds of fever common in the united kingdom, two have a natural dangerousness seven or eight times as high as the third, and the fever-success of one hospital may have differed from the fever-success of another hospital only because the one hospital has happened to treat chiefly the more dangerous or the less dangerous kind of disease. Moreover the unsuccess of treatment against a given kind of fever is not expressed in a form for exact comparison unless the fever cases be classified according to age;—for the natural dangerousness of a fever to the person who has it varies greatly according to his age,—so that, for instance, a typhus patient aged 55 is at least ten times as likely to die as a typhus patient aged 15. Nor can unsuccess against a given kind of fever be spoken of in a comparative sense, without regard being had to the fact that the natural dangerousness of any given fever may be far greater in some epidemics than in others.

From Cheselden's Statement of the Result of 213 Lithotomies performed by him in St. Thomas's Hospital.

Age.	Cases classified according to Age.	Deaths.	Death-rate per Cent.
Under 10 years of age	105	3*	2·85
From 10 to 20	62	4	6·45
From 20 to 50	32	7	21·87
From 50 upwards	14	6	42·85

* "One of the three that died out of the 105 was very ill with a whooping-cough; another bled to death by an artery into the bladder, it being very hot weather at that time." *See* Cheselden's Anatomy, 12th Edition 1784. pp. 332-3.

So much as regards the caution which must be exercised when the object is to use special death-rates as means of measuring hospital unsuccess in relation to particular kinds of disease. That caution having been duly exercised, such death-rates may be of the utmost interest and value; for, in their perfection, they are true measures of medical and surgical unsuccess, and may therefore be made instrumental, both to advance the professional science in some of its most important relations, and also to enlighten the public mind as to the respective merits of hospitals. But it must not be forgotten that, even when special death-rates exist in their trustworthiest form as material for comparing hospitals together, extreme caution is again requisite as to the conclusions which the comparison may justify. The immediate effect of the comparison is to demonstrate (say) for one hospital that it is comparatively unsuccessful in dealing with a certain set of cases,—that, in it, the natural dangerousness of lithotomy, or amputation, or fever, or what not, is aggravated by some abnormal influence. But hereupon the further inquiry ensues,—of what nature was the abnormally endangering influence which led to the demonstrated waste of life? The main possibilities of answer are three:—first, that the patients (from local circumstances, common to the population out of which they came) were of less than normal powers of life*;—or, secondly, that the treatment was inferior;—or, thirdly, that the hospital was unhealthy. Absolute decision between those alternative verdicts cannot in any case be made without further information than the mere special death-rate would afford; though of course persons practically familiar with the subject would often recognise a primâ facie probability against one verdict or another in regard of the particular speciality of unsuccess. Commonly each special death-rate will have to be broken up into such component parts as respectively represent the operation of different morbific causes, and thus serve to confirm or rebut particular inculpatory suspicions. But, beyond this, other special death-rates of the same hospital might have to be examined, and the special death-rates of the hospital might have to be compared with analogous death-rates of patients in the outside surrounding population, and the general sanitary state of that population might have to be taken into account.

Perhaps I cannot better illustrate the significance of these several questions than by referring to the part of the subjoined report which discusses the death-rate of major amputations, and particularly to the reporters' analysis of certain information which Mr. Teale published in 1858 with regard to 679 amputations of thigh and leg performed during the three preceding years in the various hospitals of England. The evidence shows (see annexed

* With this answer, of course, the reponsibility of the hospital would be absolved *See* foot note, p. 50.

table)* that the average death-rate per cent. of such amputations is higher in London hospitals than in country hospitals† in

* TABLE showing Mr. Teale's account of 679 amputations of thigh and leg performed in different hospitals in England.

		Number of Cases.	Number of Deaths.	Per-centage of Deaths.
I.—All the 679 amputations whether for disease or for accidental injury	1. In London hospitals	344	103	30
	2. In hospitals of large provincial towns	83	32	38½
	3. In country hospitals	252	70	27¾
II.—The 217 amputations which were for accidental injury	1. In London hospitals	98	49	50
	2. In hospitals of large provincial towns	36	19	52¾
	3. In country hospitals	83	31	37½
III.—The 462 amputations which were for disease	1. In London hospitals	246	54	22
	2. In hospitals of large provincial towns	47	13	27⅔
	3. In country hospitals	169	39	23

† The information collected by the reporters themselves with regard to 1837 major amputations (thigh, leg, foot, arm, and forearm) leads me to believe that the difference of success may be even considerably greater than Mr. Teale's figures represent: —that is to say, when those different amputations are taken together into calculation, it appears that, per 100 of them, the death-rate in the country hospitals is 19, in the hospitals of provincial towns 25½, in the hospitals of London 29½,—or, in other words, that the special death-rate in the London hospitals is half as high again as in the country hospitals. Unfortunately the argument respecting these figures cannot be followed out, because the reporters were but very rarely able to learn the causes of such deaths as had occurred, and were even unable to obtain such information as would have enabled them to divide the amputations into the two main classes of *amputations for disease* and *amputations for accident*. Therefore it is that in the text I refer to Mr. Teale's less extensive but far more complete information. Here, however, I insert a table, which, if it serves no other purpose, may at least in some respects conduce to check hasty generalisation on the present difficult subject. It is founded on the tables which stand at pp. 555–8 of the subjoined report. It shows (inter alia) that, while the amputation death-rate in London hospitals *generally* was half as high again as in country hospitals, the high death-rate was not common to all the London hospitals,—that, on the contrary, nearly half of the London amputations (187 out of 410) were done with about the same death-rate as the 502 rural amputations,—and that so, far as those small materials for comparison go, London hospitals do not nearly so much differ in the aggregate from country hospitals as they differ individually from one another.

TABLE showing some of the statistical results obtained by Dr. Bristowe and Mr. Holmes with respect to amputations performed at different hospitals of United Kingdom.

Period to which the statement relates.	Hospitals.	All major amputations. Cases.	Deaths.	Per-centage of deaths.
3 years	Bartholomew and St. George's	165	32	19½
4 ,,	St. Thomas's	138	43	31½
2 ,,	Guy's			
1 ,,	London	85	41	48¼
3 ,,	University			
2 ,,	Free			
¾ ,,	Middlesex			
1 ,,	Westminster	22	4	18½
3 ,,	St. Mary's			
*	Total of 10 London hospitals	410	120	29¼
From 1 year to 7 years.	34 Rural hospitals	502	95	19
From 1 year to 10 years.	20 hospitals of large provincial towns	925	236	25½

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the proportion of 30 to 27¾. Prima facie it is not probable that the treatment of such cases in London is inferior to the treatment of them in the country; and if provisionally that doubt be set aside, the apparent question to be solved is:—does the higher death-rate in London express that the London hospitals are less healthy than the country hospitals, or does it express that the average Londoner is less able than the average rustic to bear up against severe surgical operation? Now, let Mr. Teale's figures be followed a stage further:—it appears (though unfortunately the numbers are not so large as to make the conclusion incontestable) that the higher death-rate of London amputations does not belong to all the amputations indifferently, but belongs exclusively to amputations done for injury,—that in these cases the London death-rate exceeds the rural death-rate in the proportion of 50 to 37½, but that in the other amputations the London death-rate is even a shade better than the country death-rate. If the figures given in the table express even approximately the true state of the case, it would seem an open question whether vital differences between the Londoner and the rustic do not count for a good deal in determining the apparent differences of hospital success*;— for differences of vital force would be likely to show themselves most in cases of such extreme vital shock as are primary amputations done on account of recent injury;—and if the influence which determined the greatly higher death-rate of the 98 accident-amputations had been the influence of hospital unhealthiness, it is difficult to imagine why so powerful an influence should not have affected the death-rate of the 246 disease-amputations done in the same hospitals. Properly to discuss the question here suggested is quite impossible with existing data. For in such a discussion the elementary points for consideration would be these:—How many of the cases died under operation, or so soon afterwards that hospital unhealthiness (if it existed) could not have affected the result? How many

* In relation to the particular figures which are under discussion, this question would have two parts: (1) Is the average Londoner less strong against vital shock than the average rustic? and (2) does the Londoner who comes for amputation on account of accident present on the average more bodily injury, especially as regards complication with internal damage, than the hurt rustic who goes for amputation? Strictly speaking, however, both of these questions ought to have been settled before the special death-rates are compared; for otherwise the comparison is not made with regard to equal difficulties of treatment. And for this purpose, as I have suggested at a former page, the record of amputations ought at least to enable any one who examines it to separate *complicated* from *uncomplicated* cases. Dr. Bristowe and Mr. Holmes are themselves of opinion, and speak of it as matter of general belief, that operation-cases treated in London are on the average cases of greater gravity than those treated in the country:—there is they "believe, very little doubt, that if we could take a considerable number of the accident cases requiring operation admitted into the wards of a hospital in a large manufacturing or seaport town, and compare them with an equal number of accident cases requiring operation admitted into a purely agricultural hospital, we should find the former comprised a much larger proportion of complicated cases, of cases of "smash," than the latter; in other words, the compound fractures arising from railways, from machinery, from building operations, among shipping, and in dockyards, are more likely to be associated with other grave injuries than those occurring in country towns and among agricultural labourers." *See* below, page 562.

died of complications, which quite unquestionably were accidental? How many died of diseases which hospital unhealthiness can produce? What, as regards these sub-specialities, are the death-rates of other hospitals, some similarly, some dissimilarly, circumstanced? And what are such death-rates for private practice, in the hospital district and in other districts? In order to speak with confidence on such points as these, it would be an absolute sine quâ non to possess fully elaborated exact returns relating to very large numbers of cases and especially to their causes of death.

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It is very much to be regretted that no such returns exist. And adverting again to the point at which I took up this particular illustration of the mode in which special death-rates have to be discussed, I must express my very strong feeling that these are matters on which doubt ought not to be suffered to continue. For, whether a particular hospital or group of hospitals has a disproportionate quantity of unsuccess in its treatment of disease, is not a question of sterile statistical curiosity. The consideration that, where such unsuccess exists, two out of the three solutions which can be suggested for its existence are solutions which would criminate the hospital or group of hospitals to which they refer, is surely argument enough to show how very greatly it is the interest of properly conducted hospitals to cause full and truthful records of their respective experiences in such matters to be kept. And if it is the interest of such hospitals, also, I will venture to say, it is their duty, and the duty of all. Indeed I beg leave to extend this expression of opinion to the entire matter of hospital experience. The doings of hospitals and the relative successfulness of such doings, are of great public importance; and all questions concerning them ought to admit of being answered quite unambiguously to the public. For, while hospitals claim to be exempt from taxation on the ground that they render service for which otherwise the community must be taxed, the community may surely require to be satisfied by precise information as to the value of the service which is rendered. In none but the largest hospitals could the task of keeping such records be of anything like troublesome amount. And in these particular cases there exists an additional and special reason why even a really troublesome duty ought not on any account to be declined. Such hospitals are, always or generally, our great schools of professional study. And assuredly no hospital school of medicine and surgery is doing its full duty, unless it takes all possible means for recording the hospital experience in forms which shall test the efficiency of present practice, and ensure the promptest possible recognition of progress. No school of medicine deserves its name unless it be the scene of constant labour for improvement in professional science; and scientific medicine cannot be supposed to rest its belief on vague oral traditions of experience.

Let not, however, the preceding observations be misunderstood. My point is, that, during the present grievous imperfectness of

hospital statistics, we cannot by such statistics accurately compare even in part (much less in entirety) the success of one hospital with the success of other hospitals, nor, à fortiori, the healthiness of one hospital with the healthiness of others. And I deem this to be a public wrong, and a bar to scientific progress. But meanwhile, happily for mankind, hospital unhealthiness is not a something about which no judgment can be formed, or which must needs wait unamended till by elaborate comparative statistics we have its exact mathematical measure before us. Sanitary defects, where they exist in hospitals, are appreciable by the skilled daily observers of the sick,—appreciable, in individual cases and according to common hygienic laws, as causes of disease or interruptions of recovery. I propose therefore to bring under consideration the elements from which these appreciations may be made, and, in order to do so, must first advert to the sanitary difficulties with which hospital managers have to contend.

The rules of hospital hygiene are, in principle, simple enough. That which makes the healthiest house makes likewise the healthiest hospital,—the same fastidious and universal cleanliness, the same never-ceasing vigilance against the thousand forms in which dirt may disguise itself, in air and soil and water, in walls and floors and ceilings, in dress and bedding and furniture, in pots and pans and pails, in sinks and drains and dustbins.* It is but the same principle of management, but with immeasurably greater vigilance and skill:—for the establishment which has to be kept in such exquisite perfection of cleanliness is an establishment which never rests from fouling itself; nor are there any products of its foulness—not even the least odorous of such products, which ought not to be regarded as poisons. Above all, this applies to the fouling of the air within hospital wards by exhalations from the persons of the sick. In such exhalations are embodied the most terrible powers of disease,—the spreading flames, as it were, of some infections, and the explosive fuel of others; and any air in which they are let accumulate soon becomes a very atmosphere of death. Against this danger ventilation is the one possible safeguard,—ventilation which with continuous current shall always be bearing away, as rapidly as evolved, every volatile taint which rises from the sick. So that, for hospital hygiene, ventilation requires pre-eminent regard. And if ever the

* Detailed considerations on the subject of hospital cleanliness, and generally on cleanliness in its relation to the sick, are so ably given in Miss Nightingale's two volumes of *Notes on Hospitals* and *Notes on Nursing*, that, even if the limits of my report permitted me (which they do not) to enter upon such considerations, I could not do better than refer to those well-known works. I cannot do this quite unreservedly;—for some parts of the *Notes* (especially the parts which relate to the contagion of disease and to the interpretation of hospital records) are, for obvious reasons, not written with the same knowledge of facts as the parts on which Miss Nightingale is herself a high authority—the parts on cleanliness and on nursing. But while I necessarily take exception to the first-mentioned parts, I must express my strong sense of the general value of the books, and my sincere admiration of Miss Nightingale's exertions for hospital improvement.

phrase "well ventilated" may be (though indeed it never ought to be) at all indulgently construed in respect of a common dwelling-house, it must never, in respect of a hospital, be construed but with the utmost conceivable strictness.

There then lies the essential difficulty of hospital management, —a difficulty which many hospital administrators have found it easier to evade than to conquer. It is the difficulty of providing that throughout the whole of a really active hospital the means of cleanliness, and, foremost, the means of ventilation, shall be proportionate to the many special sources of foul and infective material. If that difficulty be not successfully met, certain characteristic evils will sooner or later arise:—diseases which are communicable from person to person will show an especial tendency to spread in the hospital, from patients to nurses and other attendants and to visiters, and perhaps even among the patients themselves;—and among the surgical patients, wounds will show an especial tendency to deviate from the normal course of healing—an especial tendency to start certain peculiar morbid processes of their own. It is obvious that so far as those evils are in the ascendent, so far the usefulness of a hospital is lessened or annulled. And such being their high importance to the matter which is here under discussion, it seems to me right that I should speak of them separately and in some detail.

First, as regards the *spread of communicable diseases*:—each communicable disease has its own laws of communicability,—laws which must be properly understood if the danger of contagion is to be guarded against. The communication of some diseases (of scabies, for instance, and favus) is not by any true product of the human body, but consists in the migration of parasites, or germs of parasites, animal or vegetable, from one person's body to another,—a migration which of course the recipient may to any extent facilitate by dirty personal habits, and which, as regards some parasitic diseases, can scarcely be conceived to occur otherwise than in consequence of such habits. Other communicable diseases (and for hospital purposes they are the greatly important group for consideration) communicate themselves by that process which is distinctively called *zymotic*:*—in the first affected body, and by or with a specific chemical transformation of some of its material, there is generated or multiplied a specific *zyme, contagium*, or *ferment*; which, if transferred while active to a second (not accidentally insusceptible) body, will there, according to the common law of ferments, excite the same morbid phenomena, the same chemical changes, as those amid which itself was begotten.† The several zymotic diseases are etiologically

* I take the present opportunity of suggesting, as in my opinion a most desirable amendment of present uses, that, in sanitary discussions, the word "zymotic" should never be employed but in its exact pathological sense.

† Some of the above expressions are meant to hesitate between two particular assertions. In this respect they correspond to the uncertainty which at present prevails as to the exact nature of some or all morbid ferments. A few years ago it might have seemed permissible to describe without reserve the contagia of the

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quite distinct from one another.* Also they differ widely in their manifestations, and have widely different degrees of importance; some of them being comparatively trifling local ailments, while others are fevers and fluxes of more or less considerable danger

zymotic diseases, as but some changing organic material of the first affected body. At present, however, reserve on that point is necessary. That the power of contagiousness is associated with such changing organic material is certain;—but whether the power be *proper to the material*, or be only *contingently* its attribute, seems to require further investigation. The recent very interesting experiments of Professor Schröder in Germany, and of M. Pasteur in France (published respectively in Wöhler and Liebig's Annalen der Chemie, and in the Comptes Rendus de l'Académie des Sciences) aim at proving, most extensively, an essential dependence of specific fermentatory and putrefactive changes on the presence, in each case respectively, of some characteristic molecular living thing; and they give it to be understood that, if certain fermenting or putrefying organic matters tend by their contact to bring a given quiescent organic compound into chemical excitement like their own, this contagious power of theirs depends on their carrying with them those distinctive microscopical animal or vegetable forms which in each case respectively are the true agents of change. The conclusiveness of those experiments in the field to which hitherto they have been confined is still matter of the warmest scientific controversy; and while therefore it would be at least premature for me to insist upon them as evidence even in that field, it would be yet more premature for me to speculate on the possible results of an extension of similar researches to the pathology of zymotic diseases. But it is impossible to ignore their very important bearing in that direction. It may be that broad distinctions will have to be drawn among the diseases which I here speak of as zymotic, or at least between them and some or all of the traumatic infections. Indeed, I gather from Canstatt's last Jahresbericht that already M. Monoyer, of Strasburg, in a recent work on Fermentation, has attempted a beginning in this matter. As connected with the argument in my text, it may be worth while to mention here that the different sorts of vibriones which M. Pasteur describes as the essential powers in putrefaction are, according to him, not only independent of atmospheric air, but are killed by it;—so that, for instance, when butyric acid is forming in a saccharine solution, the butyric fermentation may at will be stopped by a current of atmospheric air, which kills the vibrionic ferment; though, on the other hand, a current of carbonic acid may traverse the solution for an indefinite time without affecting that infusorial life. [While this report has been in course of printing, I have had some fresh search made for evidence of infusorial life in the clots and suppurations of pyæmia; but hitherto the search has been in vain.—July 1864.]

* How their respective first contagia arose, is, as regards nearly all of them, quite unknown. This, in pathology, is just such a question as in physiology is "the origin of species." Indeed, regard being had to matters mentioned in the last foot-note, it is hardly to be assumed as certain that these apparently two questions may not be only two phases of one. Hourly observation tells us that the contagium of small-pox will breed small-pox, that the contagium of typhus will breed typhus, that the contagium of syphilis will breed syphilis, and so forth,—that the process is as regular as that by which dog breeds dog, and cat cat, as exclusive as that by which dog never breeds cat, nor cat dog; and, prospectively, we are able to predict the results of certain exposures to contagion, as definitely as the results of any other chemical experiment. But, retrospectively, we have not the same sort of certainty; for we cannot always trace the parentage of a given case of small-pox or measles. And here, notwithstanding the obvious difficulties of proof either way, some persons will dogmatize that there must have been an overlooked inlet for contagium, while others will dogmatize that there must have been in the patient's body an independent origination of the specific chemical change. Presuming (as may pretty confidently be presumed) that in the history of mankind there was once upon a time a first small-pox case, a first typhus case, a first syphilis case, &c., and admitting our entire ignorance as to the combination of circumstances under which those first cases respectively came into existence, we have no scientific reasons for denying that new "spontaneous generations" of such contagia may take place. But, as regards some of the diseases, there are conclusive reasons against supposing that this is of frequent occurrence. Where we can observe isolated populations, we find very long periods elapse without any new rise of certain "species" of disease. For instance, in 1846, the contagium of measles was imported by a sick sailor into one of the Faroe Islands, and led to an epidemic which attacked more than 6,000 out of the 7,782 inhabitants; sparing only the persons who previously had had the disease, and 1,500 who were kept out

to life. The different ferments by which they severally are communicated have respective peculiarities of their own,—peculiarities which are primarily governed by the nature and anatomical relations of the morbid process in which each particular ferment originates:—all of them are essentially unstable and transitory, but, while some of them tend under ordinary circumstances to undergo a rapid extinction, others of them can with comparative ease retain their power for long periods of time, and some apparently have not their full force till some time after they have left the diseased body;—some of them associate themselves indistinguishably with one or more of the common excretions and exhalations of the body, others are separately tangible in vesicles and pustules or at ulcerating or suppurating surfaces, and may or may not also exist in other products of the body;—some of them are evolved in small quantity, others in very large quantity, or with very large natural admixture;—some of them are fixed, others but very scantily volatile, others as volatile as if they were vapors;—some of them operate easily on a second body by mere contact (more or less prolonged) with the outer or inner surface to which they are applied, others are not found to act unless they come into contact with accidentally abraded surfaces, or be thrust into the bodily substance by inoculation. Thus,—in vaccine lymph and in the matter of chancres respectively, there is a contagium which we know only in a fixed form, and only as communicable by intentional or accidental inoculation:—also ophthalmia and gonorrhœa and glanders are communicable by the fixed contagium which their pus contains; but this contagium does not need inoculation to infect the mucous membrane to which it is applied; and as regards ophthalmia, there are reasons for suspecting

of reach of contagion; but before that time *there had not for* 65 *years been, in those islands, a single case of measles.* And the statistical return to which I have already often referred (Parliamentary Paper, 1864, No. 12.) contains another very striking illustration of the same sort of thing:—England has 627 registration districts. During the 10 years 1851-60, scarlatina, small-pox, and measles were (as usual) prevailing more or less throughout the country, producing among children under five years of age an average annual mortality of 802 per 100,000; *i.e.*, by scarlatina 419, by small-pox 103, and by measles 280. In 626 of the registration districts there were deaths (and, for the most part, in not inconsiderable quantity) from one or more of those causes;—not quite invariably from all of them; for 43 of the 626 (thanks no doubt, to vaccination) had not any death by small-pox, and among the 43 districts which thus escaped mortality by small-pox, there was one which also had not even a single death by measles;—but, with these exceptions, all the 626 districts had deaths from the three diseases—deaths by measles, deaths by small-pox, deaths by scarlatina. But the 627th district had an entire escape. In all the 10 years it had not a single death by measles, nor a single death by small-pox, nor a single death by scarlet fever. And why? Not because of its general sanitary merits, for it had an average amount of other evidence of unhealthiness. Doubtless, the reason of its escape was that it was insular. It was the *district of the Scilly Isles*; to which it was most improbable that any febrile contagion should come from without. And its escape is an approximative proof that, at least for those 10 years, no contagium of measles, nor any contagium of scarlet fever, nor any contagium of small-pox had arisen spontaneously within its limits. I may add that there were only 7 districts of England in which no death from diphtheria occurred, and that, of those 7 districts, the district of the Scilly Isles was one. Still to say that a disease is contagious is not to say that it may not arise without contagion. Indeed I shall presently adduce evidence to show the circumstances under which the "spontaneous generation" of the traumatic infections takes place. And the statements which were published in 1862 by Dr. Salisbury in the American Journal of the Medical Sciences, as to the producibility of measles by inoculation and other infection with *straw fungi*, deserve to be borne in mind.

that to some extent the contagious pus may retain its activity when dry enough to float as dust in the air:—in some forms of milzbrand (including, probably, the so-called "malignant pustule" which is the best known human form of the disease) the highly virulent fluids can, it is alleged, infect by soakage through the cuticle:—in diphtheria, the characteristic exudation is capable of infecting by contact; and though often the disease is communicated from person to person without any manifest transplantation of matter, it may be that in such cases particles of the decomposed false membrane are conveyed as a volatile contagion:—cholera and typhoid fever send forth their respective contagia for the most part, if not exclusively, as matter dissolved or suspended in the evacuations which pass from the patient's bowels; and probably these evacuations (which, at least in cholera, gradually develop their full infective force after their discharge from the body) can under some circumstances bring into similar contagious fermentation the excrement with which they are mingled in privies, drains, and cesspools, and can thus convert the effluvia and leakage from such sources into means of extensive secondary infection of air and water:—the volatile contagion of hooping cough is probably disengaged in large quantities by the air-passages, and as it forms is sent forth with the breath:—in typhus, small-pox, measles and scarlatina, the diffusion of volatile contagium occurs to a vast amount, probably with all exhalations from the body; and in addition to this, contagium, more or less fixed, collects abundantly about the patient's person and bedding; and, in a far less degree, something of the same sort probably occurs in erysipelas. It is evident that many of these contagia can scarcely be deemed sources of danger for well-conducted hospitals. If proper ward-discipline exists, no patient is allowed to expose himself to the risk of close intercourse with cases of contagious disease;—and, subject to that condition, most morbid poisons are of little effect except where the sanitary circumstances are grossly bad. Contagions which will not spread except by inoculation, or by the kindred agency of dirty bedding, or dirty towels, or dirty sponges, or dirty fingers, or by the drinking of polluted water, or by the effluvia from drains or cesspools, ought to be absolutely incommunicable in hospitals. So ought those to be, which will not spread except where pus, or matters like pus, are abundantly floating in the air.* But

* The extent to which organic matter may be present as floating dust in such atmospheres as that of an ill-ventilated hospital ward, is only beginning to be recognised. A minute examination of external air for solid matters, which might perhaps be disseminated in it, had been made during the cholera epidemic of 1849 by Dr. R. D. Thomson, and the results of his inquiry (which, however, were negative) were communicated by him in 1850 to the Royal Medical and Chirurgical Society of London. Again, towards the close of the cholera epidemic of 1854 (when a Medical Council with a Committee for Scientific Inquiries was advising the then General Board of Health on matters relating to the epidemic) an inquiry of the same nature was, at the instigation of the Committee, made by Dr. Thomson and Mr. Rainey; and the results of this inquiry were published in 1855, with the report of the Committee upon them. Though again there were no results which could be deemed important in relation to cholera, Mr. Rainey gave some interesting evidence as to matter which may be suspended in the air. Floating in the air of the cholera

not all diseases which are capable of spreading in hospitals spread according to those types of uncleanliness. I advert to others in which the patient during many successive days and nights evolves, continuously and in profusion, volatile, highly diffusive, contagia. Such diseases are typhus and small-pox and scarlatina and measles. And it is peculiarly while they are being treated in a hospital, that the merits of the hospital ventilation may be tested. By no known resource of science can it be contrived that patients suffering from those diseases shall not be probable sources of infection to persons of normal susceptibility, who, for the first time, come into close relation with them. Fortunately it happens that to have once had any of those diseases is, generally speaking, a protection against having the same disease again; and that to have been properly vaccinated (all the more if re-vaccination after puberty have been performed) is almost perfect security against any serious danger from small-pox. Persons of adult age, who are likely to be in attendance on the sick, are nearly sure to have had measles, for its contagium is universally current in this country; and for a similar reason they are very likely to have had scarlatina and (if they have not been vaccinated) small-pox. Thus, as regards those diseases, such persons are in great part an insusceptible population. But not so with typhus. For happily the contagium of this terrible fever is of comparative infrequency among us;—and when epidemics of it occur, it must

ward of St. Thomas's Hospital, there were not only minute hairs, particles of smoke, epidermic scales, vegetable fibres of different kinds and colours, starch granules, &c.; but also there were living forms, both animal and vegetable,—vibriones, namely, and the mycelia of fungi. Since that time, the inquiry has accidentally received a new impetus in the interest excited by M. Pouchet's observations, published in the *Comptes Rendus* of 1859 and 1860, as part of his endeavours to establish the spontaneous generation of rudimentary organic forms;—for though the gist of his evidence was to deny the diffusion of living organic germs in the air, he added new proofs as to the abundance of organic débris which even the external air may contain, and he devised a new apparatus for demonstrating the shaped ingredients of the atmosphere. Recently the inquiry has become important for my present subject. Two years ago, in the discussion of the French Academy of Medicine on the subject of hospital hygiene, M. Devergie mentioned some examinations of air which had then recently been made at St. Louis by M. Chalvet, house surgeon of that hospital, with the result of finding in the surgical wards a much larger quantity of floating organic matter than in the medical wards:—especially in the neighbourhood of cases of hospital gangrene there are, M. Devergie says, "enormous proportions" of such matter; and in an analysis which was made by M. Kullmann of some of the dustings or plaster from the rarely whitewashed walls of the wards, 46 per 100 was found to be organic matter,—proportion véritablement effrayante, qui transforme les parois de la salle en un foyer d'infection permanente, laquelle infection varie en plus ou en moins suivant la condition de l'atmosphère." M. Chalvet's experiments were suggested by some which M. Reveil had previously made (with substantially similar results) at La Riboisière. In 1861, Dr. Eiselt of Prague stated that, during an epidemic of ophthalmia which had recently prevailed in the Foundling Establishment of Répy, he had been struck with the fact that elder persons (including himself, the surgeon to the establishment, and several nurses) were attacked with the disease,—persons whose eyes certainly had not had, in the ordinary sense of the word, any contact of purulent matter;—that this fact suggested to him to examine such matters as he could collect, (with a modification of Pouchet's aeroscope) from the air of one of the wards;—that he did this one morning "after the ward had been ventilated," taking for his aeroscopic station the space between two beds in a ward where there were 33 cases of acute purulent ophthalmia;—and that after the first passage of air through the instrument, pus-corpuscles were evident on the glass. See Zeitschr. der k. k. Gesellsch. der Aerzte in Wien, 1861, Wochenblatt 13.

very often be the case that those who are nursing the sick have themselves never had typhus, nor ever before encountered typhus contagion. Of such persons, a certain considerable proportion will, notwithstanding any hitherto known perfection of sanitary circumstances, be found to contract the disease. And the same sort of danger will of course affect them when ministering to the sick with small-pox, scarlatina and measles, if from any cause they still happen to have susceptibility for those diseases. In the present state of knowledge it cannot fairly be deemed ground for presumptive condemnation of a hospital, that typhus, or any of the last-mentioned diseases, spreads to some of the persons who are in attendance upon the sick. There is inevitably a certain quantity of danger to be encountered, and that danger, even when reduced to its minimum, will not fail to be represented in its result by a certain quantity of suffering and death. But the quantity varies according to the sanitary circumstances. Even as regards nurses, who do every personal office about the sick, the danger of contagion ranges, as ventilation and cleanliness range, from a minimum—which, in their case, unfortunately, is always a considerable danger—to a maximum, which means that perhaps half or a third of them will die. So, too, as regards those officers and servants whose attendance on typhus-patients is less frequent and less close, the range of danger, though from a very much smaller minimum, still reaches to a maximum of very great danger. And these worst degrees of danger, incurred by sanitary fault, cannot exist without great concurrent probability that the sphere of their operation will widen,—that patients who have come to the hospital to be treated for perhaps some comparatively trifling ailment will contract a fever which may kill them outright, or may give them months of suffering and incapacity,—and this, notwithstanding that the ward-discipline has been strict, and the conduct of patients obedient, with regard to the avoidance of all near personal intercourse.

From considering the spread of contagion in hospitals as (under some limitations) one evidence of hospital unsuccess, I now turn to consider that other evidence which consists in the origination of certain forms of disease.

In ill-kept hospitals wounds go on badly. Instead of running their normal course of repair and recovery, they—whether accidental wounds, or wounds made by operative surgery—undergo certain characteristic morbid changes. Erysipelas will frequently attack them. So will other morbid processes akin to erysipelas,—such morbid processes as those of gangrene and phagedæna, and putrefactions of effused or otherwise stagnant blood, and re-opening of half-healed arteries and veins, and septic and suppurative infections of the system, and so forth,—morbid processes, which, with erysipelas, may for my present purpose conveniently be generalized under the one name of *traumatic infections*. And if the hospital receive lying-in-women, these infections will constitute different forms of so-called puerperal fever.

Traumatic erysipelas is a true zymotic disease,*—a disease in which the affected materials of the body furnish a specific contagium. On but too many occasions the contagiousness of the disease has been convincingly and fatally proved;—enough, perhaps, had there been only such evidence as is adduced from hospital surgery;—but still more by evidence, again and again given, that a surgeon going to a puerperal woman from attendance on a case of erysipelas may convey the specific contagion to the uterine surface of his new patient, and occasion her death by that form of puerperal fever which under a special name is in fact but intra-abdominal erysipelas. But to say that the disease is contagious is not to say that no case of it can arise without contagion from a previous case. Indeed in this respect erysipelas has a peculiar place among the zymotic diseases. Probably, of all the specific contagia, the contagium of erysipelas stands in nearest affinity to the ferments of common cadaveric decomposition, and is therefore aptest to rise de novo whenever certain animal textures and juices, or the effluvia from such textures and juices, are falling into common putridity. Immense mortality from puerperal fever in one division of the Vienna Lying-in-Hospital, varying from about a fourth to about a ninth part of all the deliveries which took place there, was believed by Dr. Semelweiss, the head of the department, to depend on an infection of which "the *real source was to be found in the hands of the medical men in attendance contaminated with cadaveric poison.*" The other division of the hospital (reserved for the practical instruction of midwives, whose training does not require them to be brought into contact with dead bodies) suffered only about a tenth part as much as the first; and this was the more noticeable as the second division was inferior to the first in the size and airiness of its wards. Dr. Semelweiss, acting upon his supposition as to the cause of the disease, required that the male attendants of the first division should, as much as possible, avoid contact with cadaveric matter; that after such contact they should never make a vaginal examination till the following day; and that, besides very thoroughly cleansing their hands, they should systematically *disinfect them with a solution of chlorine.* The latter precaution was not introduced till some months after the more general precautions had been adopted. The result of these measures was, that the mortality of the first division at once fell to the usual average of the second division. In 1846 the death-rate per cent. had been $13\frac{2}{3}$; in 1847 it was $5\frac{1}{4}$; in 1848 it was $1\frac{1}{3}$.† And the relation of this fact to the possible "spontaneous generation" of erysipelas contagium is not, I think, far to seek. For any wound in the unhealthy state which is technically called "foul" is in fact a surface of decaying animal matter;—that which surgeons call a "slough" or "mortified part" is a dead bit of the animal body undergoing just such putrefactive changes as it might

* This is equally true of the non-traumatic erysipelas,—the pathology of which disease, however, needs not here be particularly discussed.

† See Dr. Routh on the Epidemic Puerperal Fever of Vienna, Med. Chirurg. Trans. XXXII.

H. Distribution of Disease, and the circumstances by which it is regulated.

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undergo in the dissecting room;—and accordingly, if cadaveric decompositions can easily furnish the contagium of erysipelas, every surgical ward of an active hospital must (in respect of the natural processes of disease which are going on in it) be a likely birth-place for that contagium. Thus, for instance, if a patient has been admitted with a contused wound of such severity as involves local mortification, that mortification would include in itself an essential liability to the formation of erysipelas contagium. Whether the contagium, if thus engendered, produces in that particular patient the spreading surface-inflammation which characterises erysipelas, may depend on his personal susceptibility, and specially, no doubt, on the then-existing chemical state of his live textures next adjoining the wound:—but, whether his general mass of body be or be not infected by the specific contagium which has been engendered in his wound, in any case contagium would be set free, and would act on the atmosphere of the ward:—its influence in this atmosphere would be determined by circumstances; if the ward were well ventilated, dilution or oxidation would probably have rendered the contagium inert before it had travelled far from its source; but if, on the other hand, the ward were ill-ventilated, either absolutely or in proportion to its contained quantity of ill-conditioned surgical cases, then probably the unclean atmosphere would abound with material which the contagium could convert into its own likeness; and such an atmosphere, continuous through the whole length of the ward, and perhaps receiving increments of new formed contagium from other beds than the first, would be so very dangerous an influence to even the best-conditioned wounds that probably there would be in the ward what is called an "epidemic" of erysipelas;—and, in addition to the danger that the contagion might thus by continuity of atmosphere spread from one patient to others, there is also danger, except with the cleanliest and most careful nursing, that attendants will convey it from one part of the ward to another in the successive wound-dressings which they perform.

Of the other traumatic infections, the zymotic relations are not quite so clearly established. The immediate cause of pyæmia in any given case is that some diseased part (which, however, needs not be an external * wound) so affects the blood circulating through it, that this blood afterwards excites destructive suppurations in parts to which the circulation carries it,—viz., commonly first in the lungs or (in certain cases) liver and lungs, and later generally about the body. Perhaps in its completest form, but certainly in great part, pyæmia can be experimentally imitated

* In a case of which I was cognizant (and which Mr. Bowman describes in his Lectures on the Anatomy of the Eye, p. 127) fatal pyæmia in a young gentleman was apparently produced by the accident that an ulcerated state of the mitral valve of his heart, where perhaps there had been a small primary abscess, allowed inflammatory products to flow into the blood of his left ventricle. In another case which I remember, fatal pyæmia was produced by the penetration of pus from a small mesenteric abscess into the thoracic duct, whence of course it passed on to the right side of the heart. And in several instructive cases published by Dr. Bristowe in the 13th volume of the Pathological Transactions, pyæmia is shown as occasionally complicating almost ab initio cases of idiopathic necrosis unattended by external wound.

in the lower animals by the injection of a little normal pus into a vein. And there is not, I think, any valid reason for doubting but that this kind of material infection of the blood, accidentally arising, is the essential cause of human pyæmia; —and this equally, whether the pyæmia be in connexion with internal disease, or be in that more familiar surgical combination which has here to be particularly considered. Of all traumatic infections, of all mischances to which major surgery is subject, pyæmia is by far the most fatal.* Its attacks under ordinary circumstances are happily not frequent, but it kills nearly all whom it attacks. Not all surgical patients having wounds have an equal, or nearly equal, liability to it. It shows an almost infinite preference for the cases where bone-structure (particularly cancellous bone-structure) has been injured, as in compound fracture, or in the surgical procedures of amputation and resection, and all the more perhaps in proportion as the injured bone is large. The other cases in which it occurs are principally those in which large vein-trunks have been involved in the traumatic inflammation. The local changes which in either sort of case precede and introduce the pyæmia are not hitherto well understood. But we know that very often they are part and parcel of a process which is not simply suppurative, but involves also much foulness of wound; and we know that among them the putrefactive softening of local blood-clot and other fibrinous matter has generally an important, if it have not always an essential, place. For commonly, till they set in, there will have existed protectively in each injured vein of the part firm blood-clot of greater or less extent, closing the vein towards the focus of traumatic irritation; but now these barrier-clots, undergoing just such a change as clot undergoes when it putrefies after removal from the body, soften and fuse away, partly at least into the circulation,—where apparently it is the ferment-action of their material, or of material which their fusion lets enter from adjoining sources, that establishes the pyæmic state, and therewith usually more or less of common putrid infection of the blood. That pyæmia so often pre-supposes a local working of putrefactive ferments, is a fact which concurs, I think, with other evidence to suggest the pathological affinities of the disease. And the fatal significance of putrefactive ferments in relation to the traumatic infections probably does not end here. Probably the putrefactive softening of blood-clot plays an equally important part in relation to the occurrence of secondary hæmorrhage from tied arteries,—a part far more important than the mere anatomical conditions to which, in the older literature

* Neither as regards the general population, nor as regards hospital practice, have I any means of stating in what *quantity* pyæmia prevails. But, as regards the *proportion* in which deaths from pyæmia stand to deaths from all causes in hospital-practice, I may refer to the table which the reporters give at page 553. The materials are far too small to justify any but the most moderate and negative conclusions. But, such as they are, they show pyæmia causing 50 out of 2,874 deaths in the London hospitals, and 37 out of 1,086 deaths in the country hospitals;—*i.e.* about 17 per 1,000 in the former, and about 34 per 1,000 in the latter. It must be remembered that in these quantities of pyæmia, *all* pyæmia—non-surgical as well as surgical—is included.

of this subject, a too exclusive consideration has been given. Finally, that also phagedænic and gangrenous processes are in their very essence processes of death and putrefaction for the parts which they affect, is a fact which is on the very surface of their pathology; and that at least some of these processes are true zymotic diseases, is rendered probable by very strong considerations of analogy, as well as by statements which have been published of their inoculability from patient to patient.*

An attack of any of these traumatic infections has generally the same meaning as an attack of traumatic erysipelas. It is true that any member of the whole series—erysipelas, pyæmia, softening of clot, gangrene, phagedæna—may, within a large surgical experience, occur to some considerable extent from causes which are purely personal.† And (especially where such is the origin) one of them may occur without the others. But, except where personal conditions exclusively decide the occurrence of these lamentable infections (and clearly this is only to a limited extent) they tend to prevail conjointly or in succession. That they differ somewhat from one another in the intimate nature of their respective chemical processes is possible or even probable;—but that they have in common an intimate affinity with ordinary putrefactive processes seems to be the leading fact in their pathology. Provisionally I regard them all as zymotic diseases, the respective contagia of which may arise in any putrefaction of wound-products. And this view of their nature tallies both with their just-mentioned tendency to prevail more or less together wherever any one of them prevails largely, and with their tendency thus to prevail only in concurrence with certain sanitary circumstances. In order that an epidemic outbreak of these diseases in a hospital ward shall be possible, there must, it seems to me, always be this sanitary fault;—that the ventilation of the ward (even though it be, in common parlance, fairly good ventilation) is inadequate to the quantity of traumatic impurity generated in the ward,—that thus there prevails throughout the ward, or in sections of it, an atmosphere which contains much decaying animal matter of the kind which wound-surfaces contain,—and that any zymotic change arising in this atmosphere, or on any wound-surface which exhales into it, has peculiar chemical facilities for infecting other wound-surfaces within the range of influence.

* See, for example, Thomson's Lectures on Inflammation; 1813;—p. 484.

† "Foulness" of wound-surface is, in a very large number of surgical cases, a necessary transit to recovery, being merely the gradual exfoliation of particles which the first severe onset of disease or injury has killed; and, among cases of grave injury, it very often happens that wounds (as containing either much crushed and killed texture, or much effused and stagnant blood, exposed to common atmospheric influences) will be seats of such considerable putrefaction as must necessarily infect, in a very dangerous way, the respective patients whose parts are thus affected. Any septic infection which the general atmosphere of a somewhat ill-kept hospital ward could bring to such a patient would be small, when compared with that infection which his own foul wound occasions him. Nor must it be forgotten that personal predisposition (varying with the quality of previous health) counts for a very great deal in determining the course which a given wound shall take,—so that, quite irrespectively of sanitary circumstances, a patient of damaged health will often undergo extensive sloughings or ulcerations, or more definite traumatic infections, which another patient, similarly injured, but otherwise of good health, would quite escape.

II. Distribution of Disease, and the circumstances by which it is regulated.

4. Hospital Statistics and Hospital Hygiene.

The hospital experience of past times abounds with dreadful illustrations of the extent to which this influence may operate in wards which are, in the popular sense of the words, "overcrowded" and "ill-ventilated." When John Howard (not quite ninety years ago) was writing on these matters he described hospitals where it must have been a rare thing for an important surgical case to recover.* And though horrors of that sort may now fairly be deemed to have become impossible for civil hospitals, yet, in times long subsequent to Howard's, something not very dissimilar might be seen in military practice; and the annexed report will show that sometimes, even recently, considerable prevalence of traumatic infections in civil hospitals has been due to gross faults of crowding and non-ventilation. I refer particularly to the series of instances which the reporters give at pages 547–8; and I may also advert to the striking illustration which I gave in my report of 1858 from the experience of a large lying-in hospital.† I may add, too, that the far less prevalence of traumatic infection in London than in Paris seems to be exclusively due to the far better system of ventilation which is general in London.

It often occurs that traumatic infections are for long periods absent from wards which even to the popular eye are overcrowded

* See *passim* his famous work, or even the following reference to it in Sir Gilbert Blane's admirable paper on the prevalence of different diseases in London:—"It is a remark of Mr. Howard, in the account of his visitation of prisons and hospitals, that at the hospital at Leeds no case of compound fracture nor trepan survived, till the ventilation of the wards was improved. This was effected by causing large openings to be made over the doors leading to the passages. At the Hotel Dieu, formerly so notorious for its filth, bad air, neglect, and crowding, no operation for the trepan succeeded during the whole time that M. Marceau was chief surgeon, which was fifty years, insomuch that the operation was laid aside. Such are the circumstances which engender the hospital gangrene, and are to surgeons what typhus fevers are to physicians. The air may not be so foul as actually to generate these evils; but in any degree it retards sensibly all cures, whether surgical or medical; and it indispensably behoves all those who have the superintendence of hospitals not to rest satisfied with anything short of perfect purity. Without this the most skilful treatment is thrown away. At the time in which the Hotel Dieu was so greatly mismanaged there were seen three, four, and even five in one bed. The rate of mortality was that of one in four; hardly any acute cases, childbed cases, or capital operations survived. About the beginning of this century a remarkable improvement took place in the conducting of this hospital. Of late times it has been well ventilated, never overcrowded, cleanliness carefully studied; the result of all which has been that the mortality is that of one in eighteen."

† In respect of the General Lying-in-Hospital in the York Road, during the twenty years 1837–56; Dr. Rigby, the physician of the Institution, has publicly alleged that the mortality (almost entirely from puerperal fever) ranged, *according to the efficiency or inefficency of ventilation*, from less than 5 to more than 90 per 1,000 cases delivered. Exception having been taken by the Committee of the Hospital to some parts of Dr. Rigby's statement, the statistics were re-examined, with special regard to any questionable facts, by Dr. Odling, the Medical Officer of Health of Lambeth. This gentleman, setting aside periods in regard of which any doubts could be raised, and comparing ten years during which he believed it to be 'admitted by both parties that systematic ventilation *was not* practised, with seven years during which he believed it to be "admitted by both parties that systematic ventilation *was efficiently* practised," found that during the former period the death-rate had been 46·42, during the latter period only 4·81, for every 1,000 deliveries. And after making allowance for other influences (among which, serious defects of drainage had been mentioned) Dr. Odling concluded his letter to the Committee by pointing out "that for seven years coincidentally with efficient ventilation there was an extraordinary low death-rate, and that the change from ventilation to non-ventilation was in a few months time followed by an increase of mortality."

and ill ventilated, and that in wards which do not obviously offer any such defect the diseases may have considerable prevalence. But the meaning of this apparent anomaly is (as I shall hereafter more particularly explain) that the zymotic effects of overcrowding and ill ventilation may be greatly augmented in intensity in proportion as certain kinds of disease are kept, each kind by itself, instead of being mixed and diluted with cases of other kinds of disease;—that, for instance, traumatic infection may, notwithstanding inferior sanitary circumstances, be absent from a mixed ward in which but few cases of wound are present, or in which the severe cases are in minute proportion to the remainder; though perhaps the substitution of two or three compound fractures for two or three simple fractures in this ward would suffice to develop there an epidemic of the infections in question. Also it deserves notice, that the chemical power of some of these contagia seems rather apt to linger (in spite of all ordinary cleansing) in wards which have once been thoroughly unwholesome with it,—seems as though it could to some extent fix itself to the absorbent wall-surfaces of wood or plaster. Thus, there cannot, I think, be any doubt but that in the Hospital-ship Dreadnought this kind of zymotic taint in the walls has operated injuriously on the sick; and if the same thing cannot be equally well proved with regard to ordinary land-hospitals, that, perhaps, is only because with them the same kind of experiment has not been so distinctly made.*

In the preceding observations I have endeavoured to express what in my opinion are the pathological principles on which hospital unsuccess may be judged and measured in the two matters where it is most apt to betray itself. I have taken care to exclude the supposition that an occasional solitary case of some traumatic infection, or an occasional communication of (say) typhus from patient to nurse, is, even pro tanto, proof of unskilful hospital management. I have conceded (what indeed every

* In my report of 1858, I wrote as follows on the then experience of the Seamen's Hospital:—"The old hospital ship 'Dreadnought' had acquired a very evil reputation for the prevalence of these infections; dependent, no doubt, in part on the natural ill-adaptedness of a ship to the purposes of a hospital; but probably also in part dependent on organic contamination still lingering in the wooden walls of the wards. Early last year another more commodious ship was substituted for the 'Dreadnought;' and Mr. Tudor, the resident surgeon, informs me that, whereas, in the two years preceding that change, 9 out of 22 amputations had terminated fatally, only one amputation had proved fatal out of 16 performed in the year following the change; and that, whereas formerly erysipelas and hospital-gangrene were so common and so spreading as to have let him see there at one time as many as 18 cases of hospital-gangrene, he has now scarcely seen erysipelas, except in patients admitted with it, from whom as a rule, it no longer spreads to other inmates of the ward." Thus far, it will be observed, the change had been all for the better. But little by little since that time the old state of things has returned. And now the report made of the ship (see p. 719) is, that traumatic infections are "excessively frequent," that "operations do very badly," that "pyæmia is frequent." The obvious explanation of this history lies, I think, in the suggestion made in the text. I may add that in my experience of the former St. Thomas's Hospital, I had very strong suspicions that at least one of the old wards suffered from that kind of chronic taint. And M. Kuhlmann's analysis of the wall-scrapings of the wards of St. Louis (quoted in a previous foot-note) may serve, though as a very extreme instance, to illustrate the liability of which I speak.

pathologist knows) that to some extent such events occur without any discoverable relation to conditions of uncleanliness,—that wounds will often become unhealthy from causes strictly personal to the patient,—that typhus is so powerfully contagious a disease that persons who are immediately about the sick will in very large proportion, sooner or later, have an attack of it. But of evils which are capable of gradation from small to immense proportions, surely even the smallest degree should be matter for jealous scrutiny. Hospital managers will hardly work their hospitals to the fullest advantage, unless they be vigilant even as to solitary originations of traumatic poison, and solitary cases of hospital contagion. And at least it ought to be accepted as an axiom in hospital management, that any *concurrence of cases* of traumatic infection originating within the hospital, or any spreading of febrile or other contagion to even a single *patient* within the hospital, is conclusive reason for inquiring whether the fundamental difficulty of hospital management has not here been unskilfully met.

Evidently in either case the inquiry ought particularly to be made with regard to the ventilation of the wards,—so particularly, that for my present purpose I may consider this to be the only question at stake.* If typhus spreads from bed to bed in a ward, or if traumatic infections prevail there, presumably the ventilation is not proportionate to the number and kind of cases under treatment.

Presumably there is one of these three faults: either (1) the ward, from its original construction, has not means of being well ventilated; or (2) the ward has means of being well ventilated, and the administration of those means has been neglected or bungled; or (3) patients of one kind (traumatic or typhus) have been gathered together in such proximity that no practicable ventilation suffices to disinfect their atmosphere. And to each of these three possibilities the inquirer must give separate consideration.

So thoroughly does a hospital depend for its usefulness on the capacity of its wards for the most exquisitely perfect ventilation, that in all plans of hospital construction this is the one cardinal virtue to be insisted on. The ventilation must be such as shall leave no corner unsearched by its currents. These, within the wards, must never for a moment cease flowing from inlet to outlet,—must be flowing so largely that every unwholesomeness is at once removed by them, yet so gently that they are almost or quite unperceived as currents, and so evenly that no inmate of the ward can complain that his place is unfairly scoured by them. In theory the most desirable arrangement of ventilation would be, that fresh air, proper in temperature and otherwise, should diffuse

* Of course, where typhus has spread, it may appear that patients have been in improperly close personal intercourse. If a patient who is susceptible of typhus frequents the bed-side of a typhus-patient, no ventilation of the ward can give him more security against contagion than it gives to nurses and doctors. But, as I stated at a former page, no such intercourse ought ever to occur; and, in any well-regulated ward, ample vigilance would be used to prevent it. In order to avoid the necessity for incessant qualifications of language, I assume in the argument of my text that that proper ward-discipline is in force.

impartially from about the middle point or middle line of the ward, and that the outflow of air should be by openings respectively placed above the several bed-heads in the ward. Evidently this conception could not be realized except in some system of artificial ventilation, wherein the currents would be determinately regulated, and wherein the arriving air would in case of need be modified in temperature or otherwise. Of course, there is not in that problem anything essentially impracticable, nor perhaps even extremely difficult, for physical science to accomplish. But hitherto it is unsolved. Hitherto, I believe without exception, plans of artificial ventilation for wards have been costly and fatal failures. And in the present state of knowledge, the utmost that can be said for them is that some of their appliances (specially those for withdrawal of used air) may advantageously be used as additions to that more natural ventilation which, at least in this country, has appliances provided for it in the common conditions of decent house-construction. Open windows and (as substitutable for them in certain states of weather) other direct, but less drastic, air-holes through the walls of the ward, are at present the essential *inlets* for fresh air.* They also, under many circumstances, are the *outlets* for used air:—but in this function chimneys co-operate with them,—acting, when fires are alight, very serviceably as outlets; and it never can be otherwise than advantageous to the ventilation of a ward that subsidiary shafts should give a greatly increased development to the resources of that ordinary chimney-action. For in-ventilation, then, our reliance must be upon direct air-holes, of which open windows are the chief; on these same means we must also, under ordinary circumstances of construction, rely for a large share of out-ventilation; and thus, whatever other appliances exist, a ward must be perfectly ventilable by its windows. Now, hospital construction has pro tanto failed in its first obligation, if the form and arrangement of wards, and the distribution and planning of windows, be not such that each separate ward (independently of all other wards, and of all staircases, passages, corridors, and offices) shall admit of that kind of ventilation in its completest possible form. An oblong ward, from 25 to 30 feet wide,—windowed correspondingly on its two long sides with sash-windows reaching to the top,—and windowed in such proportion to wall that between each two windows there shall be the required space for one bed-head,—and having its communications and separately-ventilated offices at its two ends;—this, by common consent, is

* Contrivances by which the effect of direct air-inlets is mitigated in relation to the inmates of a ward are principally of two kinds:—(1.) The air passes through a sieve of perforated zinc, by which its force is broken and its coldness somewhat lessened; or (2.) by means of some special ventilator, the current of incoming air has such a direction given to it, that, before it can directly affect any inmate, it must diffuse considerably in the ward, and merge its cold in the average temperature of the ward. Mr. Brotherton, of Manchester (in his pamphlet on Hospital Construction, published in 1856), has well shown the advantages of a system of air-holes, covered with perforated zinc, when set facing one another along the two opposite sides of a ward.

the form of ward which best of all answers the proposed purpose.* And in proportion as this form is departed from, in such proportion, sooner and sooner, will the limit of the ward's usefulness be reached,—the point, namely, at which ventilation will prove insufficient,—the point at which typhus will spread from bed to bed, and at which traumatic infections will arise among surgical cases.

Whether a ward's existing means of ventilation are properly utilized, is a matter of ward-discipline, which, like all such matters, requires extreme vigilance on the part of directing officers. And such officers, in addition to their other qualifications, ought to be persons of extremely acute scent for every uncleanness which can vitiate the air. It would be idle to deny that, in this catarrhal climate of ours, ventilation by open windows has its inconveniences. Unfortunately there are times when those who regulate such ventilation must admit the air but scantily, lest its cold should do even more harm than its freshness will do good. And there are times when the best possible choice between these two evils will not absolutely exclude a certain admixture of both of them;—when, at least as regards a mixed ward, the ventilation is perhaps far less than we should desire for the case of typhus or of compound fracture, yet the temperature lower than can be well borne by the patients with sensitive air-tubes and the patients with Bright's disease. To get the best attainable adjustment, it is requisite that those who superintend the sanitary management of the hos-

* On what plans of construction several wards may be combined into hospital-wholes, is a matter of little or no sanitary importance,—provided always that one ward does not impede the ventilation or lighting of another, and presuming of course that each ward in itself is healthy. If the contagious fevers respectively are treated in separate wards, the object of their separation will be somewhat more completely accomplished if the wards allotted to each fever respectively are made into separate blocks, so that the medical attendants and others—in going, for instance, from their smallpox or scarlatina patients to other patients, must always pass through the open air. But, otherwise, I am not aware of any important sanitary object to be gained by that kind of separation. The notion that a large general hospital cannot be healthy unless it be broken into so-called pavilions, each of which shall have but two stories, has not, I think, any sufficient foundation in facts. In 1858 this subject was discussed in connexion with the plans for Netley Hospital; and I cannot better express my present opinions about it than by quoting what I then wrote in answer to a reference from the War Office:—"In some of the papers which you have communicated to me, pointed allusion is made to a so-called *hospital atmosphere*, as a danger specially incidental to buildings where many patients are congregated *under one roof*. In reference to this I would observe (first repeating my conviction as to the paramount importance of ventilation in every building intended for the sick) that, if by the above-quoted expressions it be meant that *patients in clean, well-ventilated, and not over-crowded wards, with separately well-ventilated passages and staircases, are apt to breed an atmosphere* [which, along passages, or through floors and ceilings, or up or down staircases, will be] *dangerous to those under the same roof with them*, I have no information which could lead me to accept the doctrine. Under opposite circumstances, the continuity of foul atmosphere might indeed be dangerous. But as regards wards kept as wards ought to be kept, I cannot conceive that the several clean items will make a dirty total; and, so far as my present knowledge extends, I have every reason to believe that, *subject to the qualifications I have stated*, a given number of patients may dwell under one roof as safely as under several roofs." Not, subject to the same qualifications, have I any reason to suppose that patients will not recover so well on upper as on lower stories. Of the various surgical wards in which my own hospital experience has been, the one which I remember with most satisfaction was a top ward which had three stories of wards under it.

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pital, and especially those who visit the wards at night, should bring to their task, not only some skill, but great attention to details, and thorough pains-taking patience. The difficulties are at their minimum where wards are constructed as they should be. They go on increasing in the ratio in which construction shows worse, till, with some forms of ward, no two bed-spaces can be ventilated but by gusts brought across other bed-spaces, and every attempt at efficient general ventilation provokes cries of inconvenience or injury from a large proportion of the ward's inmates. It is with reference to this dilemma that hospital managers have to estimate the supreme importance of a good first construction of the hospital:—for the working capacity of a ward has to be rated, not according to a theoretical estimate of how many beds may stand upon its floor, but according to the practical issue—how much of a given kind of disease can safely and successfully be treated there; and clearly the cost of hospital construction is not cost wisely incurred, if the wards, by faults of construction, lose half or more of the working capacity which their cubic dimensions are supposed to give. Yet even with the best construction the difficulty is not quite at an end. Nor perhaps will it entirely cease till, with the progress of mechanical invention, it can be contrived that ventilation, in other respects perfect, may at will be rendered warm or cold. But meanwhile (without pretending to dogmatize on a subject which I practically know to involve a great variety of considerations) I would express a doubt whether, with our present appliances, the real minimum of the difficulty can be attained, unless, in the warding of patients, cases be classified, as far as possible, on the basis of their respective requirements of ventilation and powers of tolerating cool air.

It is in my opinion a fact of much importance for hospital success, that the two dangers of which I am particularly speaking (the danger that febrile contagion will spread, and the danger that traumatic infections will arise) vary considerably in amount according to the arrangement of cases. Each patient with certain sorts of fever, each patient with certain conditions of wound, is the source and centre of a specific air-pollution, which ventilation (as it is good or bad) tends more or less rapidly to neutralize, but which (notwithstanding even good ventilation) necessarily extends to some distance from its source. Never ought any patient to lie within range of any other patient's morbid odours or of any other patient's contagium. Invariably beds ought to be so far apart, and the spaces between them to be so well ventilated, that under most circumstances no such dangerous nuisance can be expected to occur. Whenever, with any extraordinarily infectious or offensive case, the interspaces appear to be insufficient for perfect safety, it will be right that the next adjacent beds should be left unoccupied; and if the emanations from any one patient are either so unmitigably fœtid, or (as the reporters believe of smallpox) so diffusely contagious, that no distance in one ward will suffice to render them innocuous, then a case arises for

separate treatment;—treatment which in the latter case, would be in wards special to the one disease, but in the former case might have to be in isolation.* But in my opinion the arrangement of patients in a ward ought to go even beyond what I have yet insisted on. Not only ought not any one patient to be within the sphere of any other patient's air-pollution, but also great pains ought to be taken lest similar spheres of air-pollution coalesce (if I may so express myself) at their circumferences. Especially this has to be thought about with regard to cases of typhus, and with regard to cases of severe surgical injury and operation. When several cases of either of these sorts are set together in a ward, generally it may be seen that a new increment of danger accrues in the mere fact of their propinquity,—more than common disposition of the typhus contagium to spread from patients to nurses in the ward,—more than common disposition of the wounds to fall into zymotic processes. With utopian spaciousness and ventilation, such perhaps might not be the fact. But in our actual circumstances it is greatly so, and the danger must be distinctly regarded. The cases of like nature must either be considerably separated by intervening different cases, or, if they be kept in groups according to their nature, they must, on this account, have an increased allowance of space.† In surgical

* The object of such an isolation would of course be equally well attained if a sufficient separate out-ventilation were given to the one patient's bed, by bringing it into connexion with an out-cast ventilating shaft. Arrangements by which this kind of special ventilation could be provided for such cases as might require it would, I think, be among the most useful additions which could be made to our present hospital appliances. And hints for the purpose could be gathered from the contrivances by which, in some factories, hurtful dusts which a manufacturing process engenders are, as they form, withdrawn from within the work-place by currents of out-cast ventilation, adapted by hoods to each dust-producing machine.

† Mr. Whitfield, the resident Medical Officer of St. Thomas's Hospital, who has always had his home in that hospital, and can speak with intimate personal knowledge of the last 45 years of its experience, tells me some interesting facts in corroboration of the above argument. In 1818 (when he began to attend the practice of the hospital) and for some years afterwards, the wards used to be in common for medical and surgical cases; and in those days, though no doubt the sanitary management of the hospital was not so good as it afterwards became, there was not in his recollection any decided propagation of fever among the patients, nor, except very rarely, any communication to nurses or sisters in the wards. In 1828, or soon afterwards, the separation of medical from surgical cases was made, and separate wards (one for males and one for females) were allotted to each physician; and each physician received patients in weekly turn with his two colleagues. Under this system, whenever there was an epidemic of fever, the worst fever cases of each week were sure to get gathered together into particular wards. And now fever spread. "The sisters, nurses, and pupils not only became victims to the condensation of infection, but the mortality was great, so much so that the Governors called upon the medical men to adopt some measures for its amendment. The plan then proposed was to limit the cases of fever in the old wards to 4 in each, and the new wards (north wing) then recently built, to 6." And now the old immunity returned. "On the plan being carried out, it is but fair to say that with few exceptions it was attended with the most marked success; though, that an occasional case of typhus or scarlet fever has been communicated from patients to patients, or to the nurses in the hospital, it would be vain to deny." Under the severe pressure to which the hospital was exposed in the first half of 1862, when typhus was severely epidemic in London, 10 nurses and 5 patients apparently contracted typhus from 98 cases admitted with that disease. Within about the same time, 14 cases of scarlatina were admitted, and 1 nurse and 1 patient caught this infection. Since that time St. Thomas's Hospital

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practice, especially, this matter requires particular attention:—for it is the custom of all large hospitals to separate the surgical from the medical cases, and in many of such hospitals there are further classifications which tend to throw very much together into special wards the graver kinds of surgical injury and operation.* It must not, I think, be ignored, that here, unless extraordinary precautions be taken, the patients incur an increased liability to the rise and spread of traumatic infections. For the difficulty of providing adequate ventilation for a given surgical case varies with the nature of the case,—the generation of foul products being in some cases no more than in health, while in other cases it is enormously large; and a ward, which could be adequately ventilated if it contained a fair admixture of these two classes of cases, may have an entirely unmanageable intensity of traumatic atmosphere if only the latter class of cases be received into it. Such a ward is, in every practical sense of the word, overcrowded; and the consequences of surgical overcrowding will arise in it.

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has been very inadequately represented by an adaptation of the quondam Music Hall of the Surrey Gardens. Into this building 33 cases of typhus have been received, and its contagion has affected 3 attendants, but happily no patient. Of scarlatina, 21 cases have been received, and its contagion has unfortunately affected 1 patient as well as 3 attendants. Cases of typhoid fever have of course always and abundantly been under treatment; but I have no information that contagion has ever spread from them. With reference to the sad extension of typhus in the old hospital in 1862, Mr. Whitfield mentions that of the 5 patients who apparently contracted typhus from other patients, only 1 was in the admirably constructed modern part of the hospital, the other 4 having been in the old wards, "which, it will readily be admitted, were not constructed on the most modern or best principles." And with particular reference to the large number of nurses who suffered, Mr. Whitfield writes as follows:—"On finding that there was great nervous depression amongst the sisters and nurses (not only in consequence of the patients in the house, but from the reported mortality in other hospitals of some of their sisterhood) I allowed to each in the medical wards two glasses of wine per day. From that time, with one exception, not a single nurse took the fever; and what is a remarkable fact, the one solitary nurse who caught it was one who would not take the wine." Mr. Whitfield's conclusion (and it is one to which I attach much importance) is, "that with a still greater separation than would be considered necessary for the ordinary run of disease, we might hope to admit fever and other infectious diseases during an epidemic without prejudice to the other patients. The plan would be, for the time required, to greatly diminish the number of the beds in the wards to be given up for the emergency, especial care being enforced that the beds appropriated to fever, &c. had a sufficient superficial space allowed to them, and not to over estimate the cubical contents of the wards, as an equivalent to the area round each bed;—it is one of the great mistakes of the present day. Supposing a ward calculated to contain in ordinary times 30 general patients, the dimensions of which ward might be 135 feet long, 30 feet wide, and 16 feet high, and in which ward the distance between beds would be 18 feet from foot to foot, and 6 feet from side to side, the cubical contents would be 2,160 feet per bed. By reducing the number of beds down to 18, I should make a fever ward with a distance between its beds of 18 feet from foot to foot, and 45 feet from side to side, giving cubical space of 3,600 feet to each patient; a space which I should think quite adequate to any emergency. By carefully excluding at such times all chest affections from these wards you would be enabled to allow a much larger volume of fresh air, so essential in the treatment of fever and all infectious diseases, but which would be prejudicial to pulmonary complaints."

* Adverting to the remarks made in a previous footnote on the experience of the hospital-ship "Dreadnought," I would here suggest that, where the practice is as above described, it might be well that, if practicable, every special ward should every year change the nature of its special duty.

I wish that it were in my power to complete my consideration of these subjects by comparing together on a large scale, in relation to them, the different hospital experiences of the United Kingdom. Evidently with the present materials no such comparisons can be made.* Not even *results* for comparison are forthcoming. And what value would there be in comparing results unless also *difficulties* could be compared? That a given hospital has not had in it any spread of contagious disease, or that it has not originated any cases of traumatic infection, does not necessarily imply any sanitary merit in the hospital. Either fact may merely mean that the sanitary merits of the hospital have not been tested. And surely it is no matter for praise that a hospital escapes the difficulty of an intense traumatic atmosphere by the chance that its surgical practice is petty;—still less is it matter for praise, that the hospital evades the difficulty of contagion by ruling that no contagious fever shall receive medical assistance within its wards. The merit of a hospital is to conquer these difficulties, and to conquer them at their utmost. If the hospital be in a position where contagious diseases do not appeal for admission, and where but few severe surgical casualties and operations occur, then almost certainly it may be said that the hospital is not *wanted where it stands*. It is for other circumstances than these that my proposed test of hospital management is applicable,—the test, whether contagious disease is treated with the least possible spread of contagion, and whether surgical practice goes on with the least possible hindrance from outbreaks of traumatic infection. If a hospital cannot answer this test, doubtless it is but an imperfectly healthy hospital. But if, because of the hospital's position, or because of its rules, that test of healthiness is never applied, then, whatever may be thought of the healthiness, the usefulness of the hospital is but small. In short, it is here as it was with the general death-rates. There is but one fair and practical way of estimating hospital success. In all these discussions, and whether hospitals be compared with one another, or be *judging* themselves singly on their results, the word "success" is utterly delusive unless it means "success in proportion to endeavours." Where hospitals are doing exactly similar work, there a comparison of hospital results will be a comparison of hospital merits. But in any other

* At the time when the reporters made their visits, they found that cases of traumatic infection, originated within hospitals, were (in proportion to the number of surgical cases under treatment) nearly three times as numerous in London as in the country. But they give reasons for not considering this to be a true picture of the average state of things. They also point out that in London the number of cases of traumatic infection (29) which had arisen within the hospitals was greatly exceeded by the number of such cases (41) which had been admitted with the disease already existing;—whereas, in the country hospitals, the number of cases (13) which had come from outside was but small in comparison with the number (30) which had arisen within the hospitals. Further, on examining, so far as their very limited materials would permit, the proportions in which pyæmia had contributed to the respective totals of hospital death in town and country, they found, as I have detailed in a former footnote, that in the country hospitals deaths from pyæmia in proportion to the total number of hospital deaths had been twice as numerous as in the London hospitals.

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case it must be mere playing with figures. And for me to attempt it on any large scale with such materials as I have before me would, I think, be indiscreet and wrong. Therefore I have confined myself to suggesting the principles on which, in my opinion, the working of any individual hospital may fairly be criticized by the hospital managers, and may, here and there, to a very limited extent, be compared with other standards.

I particularly regret that my materials do not allow me to submit any exact positive conclusions on the influence of site as an element of hospital salubrity,—especially as regards the broad difference between town and country. But obviously there is only negative evidence on this subject,—evidence, that such differences of site as came under the reporters' consideration were not of appreciable effect in the presence of those large other differences which universally were concurrent with them, and by which all influence of theirs (if such influence there was) must have been either out-weighed or exaggerated. As regards the relative advantages of town and country, this difficulty is strongly shown by one conclusion of the reporters:—"English rural hospitals have acquired, on false grounds, a reputation for comparative healthiness;—by their regulations, their practice, or their position, they receive habitually a far less serious class of cases than is admitted into the hospitals of London and other large towns;—this difference in the quality of the practice, is much greater in respect of medicine than of surgery, but is considerable even as regards surgery;—the result is, marked lowness of death-rates, even (in many cases) in the presence of a high degree of hospital insalubrity." Notwithstanding this difficulty, however, it may safely be assumed as certain, that, where there are *true* differences of salubrity between two different places,* hospitals at those places respectively

* By the "true salubrity" of a place, I mean the salubrity of its *common* atmosphere, and other *common* influences,—its freedom, in respect of those influences, from all tendency to breed endemic disease. A district which itself is quite salubrious may have a fictitious appearance of insalubrity from the fact that many or most of the houses in it are ill-built and ill-kept, or because large sections of its population are of unhealthy personal habits or circumstances. But distinct from these sources of fallacy, there are also in this country some known true differences of salubrity. Thus,—to take first the extreme illustration, there are some districts which breed ague and the allied disorders. Again, there are the minor differences of salubrity which depend on differences of soil, especially where clay is compared with the soils which are least retentive of moisture. Again, subject to some qualifications, there are differences of salubrity dependent on differences of level. At present, also, between town and country, there probably are true differences of salubrity—differences, however, which do not all tell one way, as well as enormous fictitious differences of salubrity. On the one hand, the common atmosphere of country is much brighter than the common atmosphere of town, and is also comparatively unpolluted by animal effluvia and many other kinds of impurity; while, on the other hand, whatever morbific influences may come from the soil are likely to be less potent in town than in country,—and, indeed, it may have been thus that the marked preference of diphtheria for rural rather than urban districts arose and is to be accounted for. But all the above differences, except the first, are of almost imperceptible effect in this country, when compared with those local influences which are irrespective of true district-salubrity,—the influences, namely, which operate in detail, and consist in multiplied separate instances of sanitary mismanagement or misfortune. So overwhelming are these latter influences, that

will, cæteris paribus, have corresponding differences of success. But, waiving all consideration of the difficulties which at present there would be in any attempt to compare the true salubrity of districts, I must observe that the principle which I have stated admits of but very limited application. For primarily the site of every hospital must be decided by the site and distribution of the population to which it has to minister; and if, as too commonly happens, reasons of trading convenience or other reasons have determined a population to settle itself in a site of comparative insalubrity, the hospital which has to minister to that population can seldom do otherwise than to some extent share the same lot. All that it has then to do is to make the best settlement which is possible within the limited area of choice. But, even under these restrictions, the choice is not a matter of indifference. Perfect security ought to be sought for the drainability and water-supply of the future hospital. A clay soil ought, if possible, to be avoided. Also, where the hospital is for a town, sites must be compared with special regard to their respective degrees of spaciousness and ventilability; and in order to get more of these advantages, so far as the pursuit of them consists with the due accessibility of the hospital, preference commonly ought to be given either to the outskirts or to the largest interior spaces of towns. Except for special reasons to the contrary, hill-tops are to be preferred to hill-slopes, and either of them greatly to valley-bottoms. And the cleaner the neighbourhood the better. But in this respect it may be proper to add, that, against the common nuisances which not infrequently exist in towns, and by which town hospitals may be aggrieved, the hospitals, like private individuals, can look to the law for protection and redress.

It would be foreign to my present purpose to discuss with any minuteness the vastly different degrees in which different hospitals endeavour to be useful to the public. But this is a matter which, in respect of many charities, eminently deserves further criticism. And therefore I would again invite attention to the statements which Dr. Bristowe and Mr. Holmes make with regard to the effect of certain regulations in restricting the usefulness of hospitals.

hitherto it has been practically impossible to get any true measure of the others. But constantly we have opportunities of observing that well-kept establishments maintain a very satisfactory healthiness in the midst of districts which popularly have the worst reputation for salubrity:—Bedlam, for instance, in the district of St. George's, Southwark, or model lodging-houses in various poor districts of London. Why St. George's, Southwark, has an exceedingly high death-rate, and why in our epidemics of Asiatic cholera it has suffered beyond most districts of London, is matter of sanitary record, on which I need not enter;—but Bedlam, having good sanitary arrangements for itself, takes no apparent share in the unhealthiness of the district in which it stands, and has never, during all our epidemics of cholera, had even a single cholera death within its walls. The Whitechapel district, in which the London Hospital stands, has a death-rate half as high again as the death-rate of St. George's, Hanover Square, and the death-rate of the West London District, where St. Bartholomew's Hospital stands, is almost equally high:—but differences like these have no necessary connexion with true differences of district-salubrity, and there is no reason whatever for supposing that, if either of those two hospitals could transfer its practice to the western district, the results of that practice would show any appreciable improvement of success.

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Especially I must advert to the rules which prohibit the admission of cases of contagious fever, and in effect exclude most other acute diseases from the benefit of hospital treatment. It seems to me that in such rules there is implied the dereliction of a hospital's most important functions. I cannot conceive any cases having more claim to hospital treatment than those cases of typhoid, and sometimes typhus fever, which the rules would expressly and rigidly exclude. To leave such cases in the ill-provided homes of the poor is not only to withhold the assistance of the charity from persons in very urgent need of the best attainable medical treatment, but it further involves, as an almost necessary result, that, the disease shall continue its ravages in the family, and perhaps greatly beyond the family, which it has attacked. Fifty years ago, adverting to this matter, Sir Gilbert Blane found it "difficult to conceive what idea the authors of such a regulation could form of a hospital as a beneficent institution, the end of which is the alleviation of human misery;" and his language might have been stronger than it was, if he could have seen such evidence as we now have, of the indirect effect of that regulation in excluding other large classes of disease which quite pre-eminently claim hospital treatment. I am far from contending unconditionally that every existing hospital ought to receive cases of contagious fever; for, among those hospitals which the reporters describe, there are some where such fevers could not be treated in common with other diseases, without the certainty that their contagion would spread. But with reference to such hospitals I must submit, that they, while they cannot safely receive fever, are but fragments of that hospital accommodation which every populous place ought to have for its sick poor. Either they ought to be reformed, so that fever could properly be treated in them, or they ought to be superseded or supplemented by others. And if the wealth and charity of a neighbourhood are insufficient for the maintenance of such a general hospital as may receive all severe cases without distinction, then, I would suggest, the maintainers of the smaller charities might do well to consider whether, in their admission of patients, the present order of preference ought not to be absolutely reversed,—whether all other claims of disease ought not to be regarded as subordinate to the claims of contagious fever.

In a preceding passage of this report I have suggested that it is, for various reasons, incumbent on the managers of hospitals to cause such records to be kept as may show what work is done in each hospital, and what is the successfulness of the work. And now, in conclusion, I will venture to submit my opinion, that it would conduce very considerably to an improved administration of funds given for purposes of medical charity, if some department of the government were annually to collect all such records, and to publish from them information which would enable just comparisons to be made between the doings of different institutions, and the proportions which such doings bear to the requirements of the respective neighbourhoods. Indeed, not only with reference

to the general hospitals to which my previous remarks have always referred, but with reference to all medical charities, it seems to me that something of that kind is greatly wanted. In saying this, I do not only refer to that very wholesome emulation and progress in the art of healing, which it would be the tendency of such a publication to develop among the different institutions of the country, but refer also and emphatically to a non-medical aspect of the question. At present, when the public is appealed to, as incessantly it is, to give money to this or that new undertaking for professed purposes of medical charity, it is almost wholly without means of judging how far the particular purposes are already accomplished. It has only *ex parte* statements before it. Nor can it well judge of the needs and merits of established charities, excepting by such statements as the directors of some charities put forth,—statements which for the most part are framed solely with the view of moving public sympathy, and which, in order to this object, are often highly coloured and partial. The want of something like method in matters of medical charity leads to an infinite waste of charitable resources, and doubtless this waste (after the manner of all wastes) implies privation in one place as against superfluity in others,—here an overlapping and duplication of well-intended charity, and there comparative bareness and destitution. A perfectly harmonious organization of these matters (such an organization as there is in Paris under the Bureau de l'Assistance Publique) is of course not to be expected under that system of voluntary co-operation which distinguishes the charities of this country. But at least an approximation to it might be made—and an approximation which would not involve the smallest sacrifice of any one institution's independence, if the public could have before it such authentic materials as I propose, for forming a judgment on the distribution and efficiency of all means of medical relief.

It would be essential to the usefulness of any such publication, that the records which it would purport to compare should be records kept on an uniform plan. And very important furtherance might, I think, be given to the general introduction of such a plan, if some of our leading hospital physicians and hospital surgeons would confer together as to the tabular forms which in their judgment might best serve to record all useful information, and would combine both to urge the adoption of such forms at their own respective hospitals, and also to recommend similar forms to other hospital officers throughout the country.

5. *Inflictions of Violence.*

i. *Accidental and criminal poisoning.*

To what extent the administration of poison causes death or disease in England is not even approximatively known. From the Registrar General's last Annual Report it appears that during the four years 1858-61, 1,059 deaths by accidental poisoning, and 509 deaths by voluntary self-poisoning, were returned to him

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as certified.* And during the same four years there were also certified 1,380 murders, of which no doubt a considerable, though not ascertained, proportion was due to poison. But evidently it would be erroneous to infer from these figures that poison does not in England prove fatal to more than from four to five hundred persons per annum. The list of deaths by poison is at best only the list of the fatal poisonings which are discovered. But here is a cause of death which is peculiarly apt to be undiscovered. For the murderous poisoner of course plans not to be found out. And the accidental poisoner—the careless dispenser, for instance, who supplies a poison instead of an innocent medicine, is at first unaware of his mistake, and may perhaps never be made aware of it. Further, as regards the victim himself,—poisons which make no decided impression on the mouth or palate may be swallowed quite unconsciously of harm, and their effects may then be confounded with symptoms of ordinary disease. And thus, in various ways, whether the administration of poison have been accidental or felonious, the essential circumstances of the case may easily be such that suspicion is not aroused as to the real cause of the illness.

Both with reference to the number of cases in which poison is recognized to be the cause of death, and with reference to the doubt whether perhaps many other deaths are, without discovery, caused by poison, my Lords have deemed it important to consider what security the public enjoys against an indefinite multiplication of such cases. And in order to the consideration of this question, I under their Lordships' orders requested Dr. Alfred Taylor to report, from his large experience, what, in his judgment, is the present degree of the insecurity;—viz., 1) to what extent is injury occasioned by the carelessness and incompetence of persons employed in retailing drugs;—and (2) to what extent are unnecessary facilities given for the purchase of poison for criminal purposes.

Dr. Taylor's report points in both respects to a most unsatisfactory state of things.

First, as regards the facility with which poison may be obtained for criminal purposes,—Dr. Taylor sums up the case by stating that "so long as a person of any age has the command of threepence, he can procure for this sum a sufficient quantity of one of the most deadly poisons to destroy the lives of two adults . . No one wishing to destroy another by poison, and having the knowledge to make a selection among drugs, can meet with any difficulty in carrying out his design. If refused at one shop, he can procure the poison at another. If refused by a druggist, he can procure it at a grocer's. If refused at a grocer's, he can procure it at a village general shop, where poisons are retailed by girls and boys, and no questions are asked. . . In the course of more than 30 years' experience in investigating charges of poisoning, I have met with a large number of cases in which murder and suicide have been perpetrated or attempted, as a result of the dangerous facilities which exist for the purchase of poisons."

II. Distribution of Disease, and the circumstances by which it is regulated.

5. Inflictions of violence.

1. Accidental or criminal poisoning.

One particular poison has indeed been the subject of legislation. Under 14th and 15th Vict. cap. 13., arsenic (in quantity under 10 lbs.) ought not to be sold otherwise than coloured with soot or indigo,—nor except with full registration of the buyer's name and residence, and of the time, quantity, and professed purpose of his buying,—nor even thus to any person unknown to the seller, unless it be in presence of a witness known to both buyer and seller. But, says Dr. Taylor, "in several cases of criminal poisoning (two occurring in 1863) which I have been required to investigate, involving charges of murder, uncoloured or white arsenic has been used as the instrument of death. Its great cheapness (one penny to twopence an ounce) places it within the reach of the poorest person. It is sold to any applicant on the most frivolous pretences; and even in the coloured state it affords but little protection, except when it is mixed with liquids. The better class of druggists do not sell arsenic by retail; the grocer, chandler, oilman, and village shopkeeper are the principal vendors of this poison; and it is clear from the numerous deaths which take place from white arsenic that they set the law at defiance, and sell the poison in an uncoloured state, in which case it may be readily administered in any article of food, without exciting suspicion."

With the sale of other poisons there is not even nominal statutory interference. And whether they are wanted for murder, or for suicide, or for the procuring of abortion, the facilities are such as Dr. Taylor describes;—for though doubtless druggists of the best class are extremely chary of selling poisons, yet, says Dr. Taylor, "the lower class of drug-dealers, including grocers, oilmen, and the general shopkeepers of villages, have no such scruples; and although, if we except strychnia, many of the more potent poisons are not found in their shops, they have still a sufficient number of noxious drugs to endanger health and life, by reason of the facility with which they dispose of them to the public."

Secondly, as regards the ordinary business of retail druggists in dispensing and vending medicines,—Dr. Taylor testifies to the frequent employment of entirely unskilled and heedless persons in this business, and to the mischief which results from the incompetence or slovenliness of such persons;—how "a large number of persons wholly unacquainted with the properties of powerful drugs and medicines are allowed to retail them to the public, on demand, without any check or control;"—how "persons who have had no professional education as druggists, and acting as oilmen, grocers, or village shopkeepers, keep for sale laudanum, tincture of rhubarb, senna, black draughts, &c., and either from carelessness in placing the bottles containing these medicines near to each other, or from ignorance, supply laudanum for the tinctures above mentioned, and thus either injure health or destroy life;"—how, for instance, opium and its tincture have often been given in mistake for rhubarb and its tincture,—how oxalic acid and other poisons have again and again been given for Epsom salts,—how

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chloride of zinc has on several occasions been given for fluid magnesia,—how arsenic has been given instead of calomel and instead of magnesia,—and so forth. In part-explanation of these lamentable accidents, Dr. Taylor points out that the natural results of incompetence and gross ignorance on the part of those who are allowed to retail drugs to the public "are increased a hundred fold by reason of the carelessness displayed in keeping innocent medicines and poisonous compounds resembling each other on shelves or drawers in close proximity." Thus, in the shops of ordinary druggists, tincture of opium and tincture of senna and tincture of rhubarb, like one another in colour, may be standing side by side on a shelf, in bottles of like size and shape, and with labels which, if only half-read, seem identical. Or strychnine may be side by side with jalapine, morphia, salicine, quinine;—and "cases have come to my knowledge," says Dr. Taylor, "where strychnine has thus been dispensed by mistake, and has caused death." But the greatest dimensions of this particular danger,—dimensions, in fact, which are almost incredible,—are reached in the general shops of country villages, where draperies and groceries and drugs and poisons are all sold, and where perhaps even foods and poisons are not kept well asunder. From shops of this description (in cases which Dr. Taylor quotes from among various instances known to him) arrowroot, rice, oatmeal, or something else in common demand, has reached its purchaser with a fatal admixture of arsenic. And in one such case (where arsenic had been given instead of arrow-root, and had of course killed the consumer) a witness who "went to the shop after the accident to make inquiries, found rice, corrosive sublimate, jalap, and oxalic acid in different papers in the same drawer, and all under the care of an ignorant boy."

And, beyond the limits of the petty village-shopkeeping, the careless custody of poisons leads sometimes to their being sold for other matters, and used, even on a larger scale, accordingly; —orpiment (arsenical yellow) sold instead of the milder poison of chrome yellow, or instead of turmeric, or instead of mustard, and used as turmeric to colour buns,—or 12 lbs. of white arsenic sold instead of 12 lbs. of plaster of Paris, and used in this supposed capacity to adulterate lozenges,—or 30 lbs. of sugar of lead sent (perhaps instead of alum) to a miller's, and used for admixture with 80 sacks of flour. Dr. Taylor gives cases where occurrences such as these have led to wholesale poisoning;—the Bradford case, for instance, where arsenical lozenges killed 17 persons and severely injured 183 others,—and the Stourbridge case, where, some years since, under the circumstances I have just described, no fewer than 500 persons were more or less affected (none fatally, but some with great severity) by the poisoning of their bread with lead. And in illustration, not necessarily of the mistaken sale, but assuredly of the most wanton and reckless use of a poison, he describes how, seven years ago, the 340 children of the Norwood school took with their morning milk-and-water about one grain of arsenic each, and suffered of course sharp

symptoms of arsenical poisoning, in consequence of a workman's having left in the boiler which he was employed to clean as much arsenite of soda as contained about nine pounds of arsenic. "Fortunately [and this accident saved 340 lives] only four gallons of the poisoned water were drawn from the boiler on the following morning. Each child had taken a quantity just within the fatal dose of arsenic."

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I venture to submit that the above-described state of things deserves the particular consideration of Parliament. For the unrestrictedness with which at present the retail trade in drugs and poisons is conducted, confers, in a curious way and to an extent which could scarcely have been foreseen, irresponsibility even for mischievous acts. Apparently the view which the legislature has taken of the matter has been, that the trade might safely be left unshackled by special regulations, and open without special licence to all who chose to undertake its practice;—for that the common law would suffice to protect the public by punishing any druggist who by his own incompetence or carelessness, or by the employment of an incompetent or careless agent, should have caused any personal harm. But the view taken by the administrators of the law has not corresponded with that supposed view of the legislature, and the absence of special enactment on the subject seems in most instances to be accepted as a ground for concluding that a druggist's carelessness and malpractice, however extreme in degree, and however fatal in result, are not in the eye of the law criminal carelessness and malpractice. Thus, in nearly all the scandalous cases which Dr. Taylor describes, the tradesman whose ill-conducted business led to loss or endangerment of life escaped with absolute impunity. "In nearly all cases which are the subject of inquests or trials for manslaughter, it will be observed that proof of *negligence* is not sufficient; the proof must amount to *gross* or *culpable* negligence in law, or the wrongdoer will escape. What gross or culpable negligence is has not yet been defined, but we learn from the verdicts of juries that the keeping of poisons and medicines similar in appearance on the same shelf close to each other is not gross negligence! So the selling of oxalic acid or nitre for epsom salts, and the keeping of these substances in contiguous drawers or packets, unlabelled until the time of sale, and then labelling the poison as an innocent medicine, does not constitute culpable negligence! The employment of youths of no experience in drugs, who cannot distinguish arsenic from calomel, magnesia, or plaster of Paris, or powdered opium from powdered rhubarb, or laudanum from tincture of rhubarb,—furnish, by the destruction of life, merely illustrations of unavoidable accident or misadventure, and not of gross negligence on the part of an employer!" Even in the Bradford case, where, in 1858-9, 200 persons were poisoned, and seventeen of them fatally, through the sale of arsenic for plaster of Paris, it was ruled that no legal carelessness had been committed,—no legal carelessness, though arsenic and

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plaster of Paris were kept in similar casks side by side, in a loft, with no evident label upon either of them,—no legal carelessness, though a boy who had but three weeks' experience in the shop was sent to choose between these imperfectly distinguished casks,—no legal carelessness, though the stuff which he brought down was given without the master's examination to the man who was waiting to make it into lozenges. Evidently this state of things implies more than the legislature can mean to sanction:—it implies not merely that the right-doing druggist shall be free from interference, but that the wrong-doing druggist shall be almost secure from punishment.

Dr. Taylor concludes his report with suggestions which deserve to have much weight, as to the reforms which are desirable in the conduct of pharmaceutical business. His fundamental opinion, that poisons, and medicines likely to act as poisons, ought not to be sold in retail except by properly educated persons, and under some other reasonable restrictions as regards both seller and purchaser, is an opinion which I submit for consideration, as one in which I entirely concur. And it seems to me that this object might be attained without giving the drug-trade any reasonable ground of complaint, and without inconveniencing the public as regards the purchasability of non-poisonous drugs. Facilities might be given to druggists to divide themselves into an upper and a lower class. At first such a division might be made by an enactment constituting into an upper class all who had previously passed an examination as pharmaceutical chemists or as apothecaries; perhaps with the further addition of all who at the time of the making of the enactment should be in bonâ fide practice as druggists on their own account, provided their trade as druggists were conducted separately from all other trade;—and subsequently to the first constitution of this upper class, admission into it might be obtained on examination before some appointed authority or authorities. To persons of this class (but with express exclusion of general shopkeepers) the office of selling poisons might be restricted. And the purchasability of poisons by the public might at the same time be made effectually subject to the rule which now ineffectually relates to the purchase of arsenic;—that no such sale shall be made except with full registration of the buyer's name and residence, and of the time, quantity, and proposed purpose of his buying,—nor, even thus, to any person unknown to the seller unless in presence of a witness acquainted with both seller and buyer. But whether or not provisions like these may seem to the legislature fit and proper for enactment, I must submit that, with or without such enactments, one particular act of legislation is urgently wanted in the matter;—an act, namely, which, either by its own language, or by empowering some department of the Government to make regulations in the matter, shall directly or indirectly provide for the establishment of a legal criterion as to what is *culpable carelessness* in the sale of drugs and poisons, and shall thus render every such carelessness an offence punishable at law.

Before closing this section of my report, I beg leave to bring under particular notice, as connected with the present subject—first, the statements which, in relation to manufacturing towns,* I submitted two years ago concerning the destructive practice of drugging infants with opium, and, secondly, the statements which are contained in Dr. Hunter's appended report (No. 14. already adverted to) concerning the use of opium in our principal marsh districts. "There can (says Dr. Hunter) be no doubt of the truth of the horrid statement made by almost every surgeon in the marsh land, that there was not a labourer's house in which the bottle of opiate was not to be seen, and not a child but who got it in some form. In other countries, where women work away from home, as in the factory towns, the children are drugged by the nurses, and one need not be surprised to find the same plan adopted here; but other circumstances combine to render it a common practice to push this drugging system to an extent known only in the districts in question. The painful rheumatisms and neuralgia which still continue to be common in the fens [i.e. among elder persons, but probably without any suspicion that the infants suffer from them] have been generally treated by the free use of opium, and with this drug the whole people have become thoroughly familiar. The wholesale druggists report that they send immense quantities to these countries, and the retail druggists often dispense so much as 200 lbs. a year.† It is sold in pills or penny sticks, and a well-accustomed shop will serve 300 or 400 customers with the article on a Saturday night. The druggists thought their largest consumers were not the villagers, or people of the little town in which the shop was, but rather the inhabitants of small hamlets or isolated farms in the fens. Opium is often asked for under some cant name, and the idea of it is as of a forbidden jollity. The quantity which an old opium eater will take has often been reported (about half an ounce a day is common) and finds its limit rather in the cost than in the strength of the drug. A man in South Lincolnshire complained that his wife had spent 100*l.* in opium since he married. A man may be seen occasionally asleep in a field leaning on his hoe. He starts when approached,

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* Fourth Report; p. 32-35 and App. IV.

† Dr. Thudichum gives me the following curious information as to the quantity of opium annually sold at one country town in Lincolnshire:—"Seven druggists in the town of Spalding sell 27 stones 3½ lbs. of opium, partly in the form of laudanum. There are 21,000 souls in the town and district of Spalding (last Census) supplied by these druggists. This gives a consumption of opium of 127 grains per head per annum. A small portion of the opium is used for sheep during lambing season. Allowing the 27 grains of every 127 to cover that purpose, which is probably an excessive estimate, there remains the startling circumstance that the consumption of opium in the Spalding district amounts to about 100 grains per individual of the population per annum. The opium is used for eating by adults, and for drugging infants. Infant mortality in that district is 21,845, while in all England it was 17,731 out of 100,000 living. The population of Spalding was decreased during the last 10 years. The above quantity of opium does not include the opium used by medical practitioners. The data regarding the quantities of opium sold at Spalding have been collected by Dr. E. Morris of Spalding, and communicated to me."

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and works vigorously for a while. A man who is setting about a hard job takes his pill as a preliminary, and many never take their beer without dropping a piece of opium into it. To meet the popular taste, but to the extreme inconvenience of strangers, narcotic agents are put into the beer by the brewers or sellers. Half a century ago the growth of poppies for the London drug market was conducted in this light land. Then the husbandman took poppy drink with him to the field; and now, although the cultivation of the article for sale is almost abandoned, the poppy capsule forms the principal ingredient of the herb teas and domestic medicines of the neighbourhood. With such familiarity with the drug, no wonder that every one is ready to use it to quiet a crying child, though only to ensure its crying again as soon as awake. Opium eaters are said to be always proselytizers, and will even give a child opium behind the back of the mother or nurse. The favourite form for infants is called Godfrey's Cordial, a mixture of opium, treacle, and infusion of sassafras. This is thickish, and is often fetched in a tea cup. When the mother going to field work deposits her child with a nurse, she thinks it best to leave her own bottle of Godfrey, because the preparations of the different shops vary, and there is not a little village shop in the country that sells anything that does not sell its own Godfrey. To push the sale of opiates in these little shops is the great aim of some enterprising wholesale merchants. By druggists it is considered "the leading article," and the profit on it is small when sold in a crude state. It has not unfrequently happened that a nurse has substituted her own Godfrey for her client's, and, frightened at its effects, has summoned the surgeon, who finds half a dozen babies, some snoring, some squinting, all pallid and eye sunken, lying about the room, all poisoned."

III. Miscellaneous proceedings.

III. MISCELLANEOUS PROCEEDINGS.

In order to complete my account of the proceedings of this department in the year 1863, I must add as follows:—

that correspondence relating to the administration of the laws concerning public health was had with the Poor Law Board, and with various local officers and private persons;

that, in addition to the vaccination-inquiries already reported on, correspondence relating to local outbreaks of small-pox was had with the vaccination-authorities of Burnley, Barnsley, Beverley, Bethnal Green, Bedale, Bakewell, Cockermouth, Dewsbury, Darlington, Docking, East Preston, Epsom, Easington, Edmonton, Faringdon, Farnham, Helmsley, Hungerford, Keighley, Manchester, Nantwich, Newtown and Llanidloes, Orsett, Oldham, Pickering, Penkridge, Reading, Spilsby, Skipton, Salford, Tonbridge, Tendring, Tamworth, Whitby, Ware, Yeovil, York, and of all the unions and parishes of the Metropolis;

that local inquiries concerning epidemics of scarlatina were made at Halstead and Holmfirth, and an inquiry concerning an epidemic of diphtheria at Langtoft;

that correspondence relating to local outbreaks of typhoid fever or other diarrhœal infection, or to the sanitary defects which promote such outbreaks, was had with the authorities of Bacup, Brompton and Northallerton, Burbage, Cockermouth, Emsworth, Eyam, Friston, Festiniog, Gilesgate-Moor, Hastings and St. Leonards, Heptonstall, Great Harwood, Harwell, Highbridge, Keynsham, Keswick, Long Sutton and Sutton St. Mary, Minehead, New Holland, Pangbourne, Puckeridge, Quainton, Rotherham, Tillington, Wing, Whitehaven, and Whorlton,—and that in 11 of these cases—those of Cockermouth, Festiniog, Keswick, Long Sutton and Sutton St. Mary, Minehead, New Holland, Brompton and Northallerton, Pangbourne, Quainton, Whitehaven and Wing—local inspections were made;

that, in continuation of the inquiries made in 1862 into the sanitary state of Rotherham (inquiries then rendered necessary by the extensive, long-continued, and fatal prevalence of typhoid fever) further inquiry in the same place was made, early in 1863, on account of the very exceptional occurrence of a considerable epidemic of jaundice;

that local inquiry was made as to an alleged endemic prevalence of tape-worm in and about Chapeltown near Sheffield;

that local inquiry was made into the particulars of an outbreak of cattle-disease (anthrax fever) which occurred in and about the parish of Swineshead, Lincolnshire, and which was of especial interest, not only as affecting several kinds of domestic animals, but also in regard of its possible relations to disease of the human subject.

I append (No. 17.) the report which Mr. Robert Ceely of Aylesbury made on the just-mentioned outbreak of cattle-disease.

Also, in illustration of the circumstances under which typhoid fever and the other diarrhœal infections continue to be extensively prevalent in this country—an illustration, however, which ought now to be almost as superfluous as it has for years been monotonous and disgusting,—I append (No. 18.) a few extracts from reports made by Dr. Ord, Dr. Stevens, Dr. Bristowe and Dr. Buchanan, on the sanitary circumstances which they found existing at Rotherham, Wing, Cockermouth, Whitehaven and Festiniog. In some of these places the extension of fever had been very greatly favoured by overcrowding of the population,—such overcrowding as would in itself suffice to breed other disease. But, distinct from this occasional aggravating influence, there prevailed more or less in all the places that condition which I have often previously reported to be the main governing condition for epidemics of diarrhœal infection;—invariably, in greater or less extent, the population was breathing the stench, or drinking the filtrate, of its own decomposing excrement. And

though the present and other recent illustrations cannot increase knowledge (which long has been conclusive) with respect to the causation of disease, they will, I hope, suggest legislative question whether for the public interest it ought to remain discretionary with local authorities to leave in full operation such fatal influences as are described.

John Simon.

APPENDIX.

Nos. 1–4.—LOCAL INQUIRIES by Dr. SEATON, Dr. STEVENS, Dr. SANDERSON, and Dr. BUCHANAN into the STATE of PUBLIC VACCINATION in various Parts of ENGLAND and WALES.

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

1.—REPORT by Dr. SEATON and Dr. BUCHANAN on the STATE of PUBLIC VACCINATION in LONDON, and on the recent epidemic of SMALL-POX.

Plan of report.

We propose to consider in this summary report the vaccination of London as a whole, referring to the experience of its component unions and parishes for the purpose of illustration only. An account of each union*, in respect of every point to be here mentioned, is given in detail in papers accompanying this summary.

The main objects of the inquiry have been—

(1) The amount of vaccination performed in London.
(2) The quality of the vaccination.
(3) The arrangements for public vaccination, considered under the heads of—
  (A) Duties of Guardians,
  (B) of Public Vaccinators, and
  (C) of Registrars,
(4) The late epidemic of small-pox in London, especially in relation to defective performance of vaccination.

After stating the results of our inquiry on each of these heads we shall add—

(5) A brief abstract, with suggestions for the better maintenance of infantile vaccination in London, and for the improvement of public vaccination.

Chapter I.—AMOUNT OF VACCINATION.

Amount of vaccination.

Failure of "registers."

There is considerable difficulty in forming even an approximate estimate of the number of persons resident in the metropolis who have been vaccinated. The "registers of successful vaccination" which the Registrars of Births and Deaths in each district are required to keep, by 16 & 17 Vict. c. 100., were intended to afford evidence upon this point in respect of children born in London since that Act was passed; but in practice they wholly fail to do so. For (1) they are based upon the returns of registered births, and we find that a considerable proportion of births are never registered at all; (2) through the omission of almost all private vaccinators, and some few public vaccinators, they fail to account for very large numbers of vaccinations that are actually performed for registered children; (3) by the operation of certain words of the Act, obviously used inadvertently, children born in one district have frequently their vaccination registered in

* We shall use the word "union" throughout this report as signifying any portion of the metropolis, whether strictly a union or simply a parish, in which independent arrangements are made for the performance of public vaccination.

1. In London, by Dr. Seaton and Dr. Buchanan.

another; and a fourth reason of our difficulty is, that by constant immigration a great number of children are living in London whose birth and whose vaccination are not shown on the registers of the town.

We found that the number of children annually vaccinated in London at the public cost is about the half of the yearly registered births. Thus, on the average of the two years 1861–2, 40,087 children under one year of age and 5,980 persons above one year of age were, according to the returns made to the Poor Law Board, vaccinated each year by the parochial vaccinators, and 5,292 vaccinations were performed at the stations of the National Vaccine Establishment. The registered births each year were on the average 96,105 (see Appendix, Table I.). Of the remaining children—some of them dead, some removed, most of them no doubt vaccinated by private vaccinators—we are not able to give any account.

Number of public vaccinations.

Evidence of neglect of vaccination.

But though we were unable to make a numerical estimate of vaccinated and unvaccinated, our inquiries gave very conclusive proof of the dangerous extent to which the vaccination of children was postponed and neglected. Upon analysis of the registers of the public vaccinators for the years 1860–61 and 1861–62, a period free from the disturbing influence of epidemic small-pox, we found that in only 9 per cent. of the children publicly vaccinated was the operation performed under three months of age; that 41 per cent. of the total vaccinations took place between the third and the fourth month from birth (the directions of the law being evidently taken by many parents to mean not within, but soon after, the age specified in the Act); and that in exactly one-half the operation had been postponed beyond the age of four months. In 37 per cent. of the total public vaccinations the children were from four to twelve months old at the time of vaccination, and in 13 per cent. the age exceeded one year.

Illegal postponement: In ordinary years;

Until epidemic small-pox.

But an analysis of the registers for the year following (1862-3), when epidemic small-pox was present, showed, further, that more serious arrears had been accumulating. We found that the primary vaccinations of 1863, between one and five years of age, were no less than 30 per cent. of the whole vaccinations under five years of age; and that primary vaccination was also performed in a large number of children above five years of age, and even in many adults. Further, we had to some extent a measure of the degree to which the vaccination under one year of age was at ordinary times deficient, in the fact that the public vaccinations at this period of life, in 1862-3, were to those of ordinary years in the proportion of 52 to 40.

Evidence from schools.

We had other evidence of dangerous postponement and neglect, from our examination of 53,185 children in various national, parochial, and other charitable schools and workhouses.

There were in the schools a considerable number of children who were either at the time of our inspection passing through, or had since the commencement of the epidemic passed through, primary vaccination; yet we found 2,837, or 53 per thousand of all the children examined, without any scars of vaccination; the vaccination of 508 more being doubtful. The proportion without any scars of vaccination in the infant schools and infant divisions of other schools was 59 per thousand. And this branch of our inquiry, besides exhibiting the neglect, displayed also its terrible consequences, for no fewer than 1,010 of the 2,837 unvaccinated children were already scarred by small-pox.

Evidence from small-pox deaths.

Lastly, we had the proof of neglect and its consequences, in the great number of unvaccinated children who fell victims to small-pox

during the late epidemic visitation. Some such children were cut off before their third month of life, but in the vast majority of them vaccination had been illegally omitted.*

1. In London, by Dr. Seaton and Dr. Buchanan.

From the data of the last Census we calculate that there are from 20 to 25 thousand children living in London below the age of three months. All these children might, without contravention of the law, be unvaccinated; and the very large majority, four fifths at the least of them, undoubtedly are unvaccinated. In these, and in children whose health requires the postponement of vaccination, there are sources of danger to the metropolis which, so far as interference of the law is concerned, are inevitable. If these were our only sources of danger,—if our population were so protected that, at periods of epidemic visitations of small-pox, our anxieties could be concentrated on this limited portion of it,—it appears to us that these epidemics would be comparatively little formidable. Our chief danger consists in the large accumulation of children illegally unvaccinated. We have shown that parents who do not neglect altogether the vaccination of their children, even in the absence of small-pox, yet habitually postpone the operation, so that, according to careful calculations which we have made, the vaccination of young children in London, at ordinary times, is effected on an average, not within the age of three months, as the law has directed, but at the age of nearly seven months; and this alone would more than double our risks. We have shown, also, that a large number of parents (in the absence of supervision) habitually neglect vaccination till they are frightened by epidemic small-pox; and that there are many others who disregard the protection of their children, even in the presence of epidemic small-pox. We cannot profess to estimate the numbers of each class; but at the outbreak of the recent epidemic the aggregate must have been very great. We found that the primary vaccinations of children between one and five years of age performed by the parochial vaccinators alone in 1862-3 exceeded 20,000, and that large numbers of children of the same ages had been vaccinated at the stations of the National Vaccine Establishment and by private practitioners.

Accumulation of unvaccinated.

The amount of postponement and neglect varied much in different parts of London. We had no difficulty in satisfying ourselves of the relative superiority in this respect of some unions to others; e.g., of St. George's Hanover Square, St. James' Westminster, or St. Martin's-in-the-fields, on the one hand, to St. Olave's, St. George Southwark, or St. Margaret's Westminster on the other; but we have no data for accurate comparison and classification of the unions. The differences observed among school children, as shown in the Appendix, are not, by themselves, applicable for this purpose, because, independently of other reasons, a greater proportion of infant and ragged schools (in which usually more unvaccinated are found than in elder and national schools) were examined in some unions than in others. Whenever we had proof of the exercise of unusual vigilance by the local authority, or

* In the absence of data as to the vaccination of fatal cases of small-pox, we have assumed death from small-pox, under five years of age, to have been in unvaccinated children, from the extreme rarity with which *fatal* cases of small-pox are met with at that period of life in children who have been successfully vaccinated. If three or four exceptional cases occurred during the epidemic, they would still not affect the validity of the statement in the text. We did not ourselves in our inquiries meet with a single authentic instance of this kind; but in many instances death from small-pox occurred in young children who were only vaccinated when they were already incubating small-pox; and we found that in not a few such cases the death appeared in the Death Register as one from small-pox after vaccination!

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

by medical officers of health, or by the local administrators of vaccination, we were sure to find a relatively small number of unvaccinated.* Sometimes the long absence of small-pox from a district appeared to be a cause determining a high proportion of unvaccinated. This was remarkably seen in the union of Lewisham, the exemption of which from small-pox had been as striking as its habitual freedom from other epidemics, and in which one of the largest proportions of unvaccinated was observed of any metropolitan union.

Causes of neglect:

In parents;

The cause of postponement and neglect of vaccination, so far as parents were concerned, was in the main apathy and indifference. Such was the result of our own inquiries, and such was the uniform testimony of those best qualified to judge by their acquaintance with the people in the various localities. Objection to vaccination on the part of parents was indeed often alleged to exist; but "objection" appeared to be usually another word for an excuse to account for the parents' neglect. And when such objection really was entertained it generally related to the early age at which vaccination was required (the grounds for early vaccination being very ill understood), or it was prompted by a fear of eruptions following vaccination, and by a vague want of confidence in the lymph employed, and in the way of performing the operation by the local vaccinators. Real repugnance to vaccination altogether, although doubtless existing in the minds of some few persons, did not appear to be the hindrance in any appreciable number of those instances where vaccination was neglected; and we obtained evidence that such repugnance existed much less now than formerly, since recent epidemics of small-pox and the general diffusion of knowledge had made people aware of the enormous protection conferred by the operation.

In badness of arrangements.

We have reason to be perfectly satisfied that a very large share of the numerical defect of vaccination was due less to the fault of parents than to the very imperfect arrangements for the performance of public vaccination. It will be presently shown that these were such as not unreasonably to injure confidence in the value and in the importance of the operation. We had frequent evidence of children being taken to the public vaccinator at appointed times and places, without finding him or a legal substitute in his place; or, when he was found, there was no lymph for vaccination, or if there was lymph it was not of the kind that parents like, fresh from the arm of another child. Some of the children whom we found unvaccinated in the schools were in one or other of these cases; and we ascertained that very many more had had vaccination attempted at some time or other, but that after the

Advantage of supervision.

* A comparison of our school inspections in the present year with some that were made in 1860 illustrates the importance of local vigilance, and shows how direct a reward is given to care and attention on this subject of vaccination. In 1860, the schools of six unions were inspected, and 109 per thousand of the school children were found unvaccinated. In 1863, the schools of the same unions gave only 47 per thousand of unvaccinated. Again, in our recent school inspection, we got evidence of how constant and systematic this local vigilance must be, if it is to operate effectually as a check upon the negligence of parents. It occurred to us to examine many schools (our purpose being primarily statistical) that had been inspected by the local medical officers a few months before. In such schools we found many unvaccinated children among scholars newly admitted, and others who at the previous inspection had been detected to be unvaccinated, and whose parents had failed to observe their promise to the local inspector to have them vaccinated.

Some schools that we examined professed to require vaccination as a condition of admission, except for children who had already had small-pox; but the rule was generally so imperfectly carried out that we did not find the proportion of unvaccinated to be much less in these schools than in others where no such rule existed.

failure of the operator the attempt had not been repeated, or had again been unsuccessful.

We found a very strong impression existing in the mind of Registrars and others who had the best opportunities of being acquainted with the dispositions of the people in regard to vaccination, that, with proper arrangement, a very moderate amount of systematic supervision would suffice to ensure a general observance of the vaccination laws.

1. In London, by Dr. Seaton and Dr. Buchanan.

Chapter II.—THE QUALITY OF VACCINATION.

Quality of vaccination.

As the best means of obtaining information on this point, we examined the cicatrices on the arms of 49,570 vaccinated children in various schools, industrial establishments, and workhouses of London.

Results as to Number and Quality of Scars from Inspection of 49,570 vaccinated children in London schools.

Vaccine Scars.	Good.	Tolerable.	Bad.		Good.	Tolerable.	Bad.
Four or more - -	8,901	3,183	1,779	or, per 1,000,	180	64	36
Three - -	8,696	3,112	2,005		176	63	40
Two - - -	6,337	3,241	2,246		128	66	45
One - - -	4,567	2,052	1,451		92	41	29

Vast amount of inferior vaccination.

We begin by assuming, as now proved beyond all shadow of doubt, that number and typical quality of vaccine scar are the elements which denote efficiency of protection against small-pox. Without waiting for the new evidence of this relation that will presently appear, we assume that every vaccination should be performed according to that rule of the Council which directs at least four good-sized vesicles or an equal amount of local effect to be produced. From the above tables it is seen that not more than 180 children in 1,000 had the high degree of protection that would be given by an obedience to this rule. Even if we admit three good cicatrices as constituting evidence of efficient protection, we find that scarcely more than a third part of the whole number of vaccinated children had received this degree of protection. Nearly two-thirds of the children examined had a degree of protection inferior to that shown by three good marks, and in nearly one-fifth of the whole number the scars were wholly bad in quality, or there was but one merely tolerable scar.*

* Primary vaccine scars only are considered in these statements. In classifying the cicatrices as to number we have always taken into account their area, and marks occupying more than the average space of a good cicatrix from simple puncture have been estimated accordingly; thus two actual marks of large size were often entered as equivalent to three or four. In classifying the scars as to quality we are conscious of having strained every point to give to a cicatrix its utmost value. One of us, indeed, was in the habit of putting down 6 or 8 tolerable marks in the list of "four or more typical" scars. And that the standard we took was not an arbitrary one, but was such as would be assented to by any one conversant with the characters and protective value of different sorts of scars, may be considered

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

As bearing on the question how far vaccination is now-a-days better or worse performed than formerly, and also on the point of the deterioration that is occasionally alleged to be taking place in vaccine lymph, we have been at the pains to examine separately the results of our school inspections for young children in infant schools and for the children in elder schools. Excluding from consideration all children in workhouses, in industrial schools, and in schools where infants were mixed with older children, we obtain the following tables, in which the actual numbers are expressed, per 1,000 of each group of children examined.

Comparison of elder and younger children.

Number and Character of Vaccine Scars.	16,021 Children in Infant Schools.				27,360 Children in Elder Schools.			
	Good.	Tolerable.	Bad.	Total.	Good.	Tolerable.	Bad.	Total.
Four or more	161	67	42	270	188	66	34	288
Three	175	66	48	289	176	61	36	273
Two	161	67	47	275	173	65	41	279
One	89	46	31	166	94	39	27	160
Total	586	246	168	1,000	631	231	138	1,000

As affording any evidence of deterioration of lymph,—of deterioration, we mean, by mere lapse of time, by mere transmission through successive subjects,—we think that no importance can be attached to the differences between the two tables. For (1) differences of greater amount were seen between the vaccination of children of the same age in various schools, (2) not unfrequently we met with schools where the younger children were better vaccinated, both as to quality and amount of scar, than the elder children in the same school*; and (3) the

proved by the close similarity of the results obtained independently by each of us. Thus *per* 1,000 *children* examined in 27 unions by Dr. Buchanan, and in 12 unions by Dr. Seaton, the scars are reported as follows :—.

Number and Character of Vaccine Scars.	Dr. BUCHANAN'S Inspection of 38,388 vaccinated Children.			Dr SEATON'S Inspection of 11,182 vaccinated Children.		
	Good.	Tolerable.	Bad.	Good.	Tolerable.	Bad.
Four or more	177	59	36	188	72	36
Three	179	63	42	161	61	35
Two	168	66	46	170	63	41
One	92	40	28	91	47	35

* The following is an example of vaccination being found of different degrees of goodness in the same locality, when children of different ages were examined apart. In the Lee National School 55 per cent. of the boys had typical (irrespective of number) vaccine scars. Of the girls 56 per cent. had typical scars. Of the baby class of the infant school, 55 per cent. again had typical scars. But in the rest of the infant school, where the children were intermediate in age between the babies on the one hand and the boys and girls on the other, only 39 per cent. had typical vaccine

relative defect among the younger children is quite as conspicuous in the matter of number as in the matter of the quality of the scars.

1. In London, by Dr. Seaton and Dr. Buchanan.

Such general inferiority as really exists in the results of vaccination of late years receives a sufficient explanation in the more extended operation of the causes to which, in our opinion, the prevalence of imperfect vaccination generally is to be ascribed,—we mean carelessness as to the manner of performing the operation, and want of proper selection of lymph; for our inquiries left no doubt upon our minds that in the desire which has been specially felt of late years to get children vaccinated at all events, the necessity of doing the operation thoroughly has been more and more overlooked. In regard to the general causes of imperfect vaccination we shall, in describing the arrangements for public vaccination in the next chapter, have occasion to show that great laxity has existed with regard to the qualification of persons employed in vaccinating; that important rules for the performance of vaccination have been departed from; that the maintenance of stocks of selected lymph has been rendered by the arrangements a matter of extreme difficulty; and that there has been a temptation to individual operators to take lymph from second-rate or inferior vesicles (when the alternatives were either to use preserved lymph or to suspend vaccinating), which could not fail to affect most prejudicially the quality of vaccination.†

Causes of imperfect vaccination.

Comparing what could be made out as being private vaccination with what was known to be public vaccination among the children whom we inspected in the schools of London, a strong impression was obtained, although not one capable of being reduced to a numerical demonstration, that children vaccinated by private practitioners had both fewer and inferior scars to those who had been vaccinated by the public vaccinators.

Private vaccination.

In the course of our school inquiry we obtained facts that corroborate in the strongest way the law of connexion between deficient vaccine scars and post-vaccinal small-pox. By showing how much small-pox has prevailed in the vaccinated children, the facts we are

Small-pox among the vaccinated.

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scars. In St. John's Schools, Marylebone, which were remarkably well vaccinated, the proportion of children with typical scars in the boys' school was nearly 80 per cent.; in the baby division of the infant school it exceeded 80 per cent.; but the children intermediate in age had been less well done.

We found no difficulty whatever in distinguishing the work of different hands in the vaccination of school children. Thus the vaccination of St. John's Westminster stood high, from the large proportion of children who had been vaccinated by Dr. W. E. G. Pearse and Dr. G. Pearse. The vaccination of St. Margaret's, Westminster, stood low, because though the scars of one good vaccinator, Mr. Painter, were seen upon many of the children, the majority had been vaccinated by another and very inferior hand. In the same way the vaccination of Mr. Guazzaroni could be recognised by its conspicuous excellence in any school of Kensington; the vaccination of Mr. Mitchell in the schools of Holloway; of Dr. Rogers in St. Ann's, Soho; of Dr. M. Davis and Mr. Duff, among a number of very fair vaccinators in St. Pancras; of Dr. Harris in St. Luke's parish; some very fine vaccine scars were seen in Lambeth Infant School, the work of Dr. Smyth. Dr. King at Eltham and Dr. Jones at Sydenham each had vaccinated all or nearly all the children that were well scarred in the schools of those suburbs respectively. It is needless to say that in citing the above vaccinators we are merely illustrating a point, and not professing to give a list of those whose results in vaccination appeared to us all that could be desired. We had in like manner in some districts no difficulty in tracing particular vaccinators by the inferiority of their marks.

† Vaccinators, under these circumstances, have considered that they were rather doing service by vaccinating a child from an inferior arm than by letting it go away, on the chance whether it would be presented for vaccination any more. Many vaccinators, with limited opportunities of selection, have mentioned to us that they soon found their lymph deteriorate, and even though they had subjects to go on with thought it right to renew their stock.

1. In London, by Dr. Seaton and Dr. Buchanan.

going to cite would be by themselves a sufficient condemnation of much of the London vaccination. We found eighty-eight children scarred by small-pox out of the 49,570 school children who bore vaccine scars. This is at the rate of 1·78 per thousand of the vaccinated children. Excluding the infant schools, and looking only to those children whose ages had given them longer exposure to small-pox, it was found (1), with respect to the quality of the vaccine scar, that out of each thousand children with typical scars 1·22 were pitted by small-pox; out of a thousand with tolerable scars 2·35 were pitted by small-pox; and out of a thousand with bad marks 7·60 were pitted by small-pox. (2) As for the protective influence of quantity of vaccination in the individual, it was further ascertained that of those children who had four scars (whatever their quality) 0·67 only per thousand were pitted by small-pox; of those who had three scars, 1·42 in the thousand were so pitted; of children with two marks, 2·49 in the thousand were scarred by small-pox; while those children who had only one vaccine mark were scarred with small-pox at the rate of 6·80 in the thousand. At the one extreme of goodness, with four or more typical scars, only 0·62 per thousand children was scarred by small-pox, while at the other extreme of badness, with one bad scar only, 19·0 per thousand were scarred by small-pox. The best vaccination, therefore, was more than 30 times as protective as the worst.

had affected most those with bad scars, and those with too few scars.

The difference between the vaccinated and the altogether unvaccinated* children, in respect of the extent to which they had suffered scarring by small-pox, was as follows: Of all the vaccinated taken together it has already been said that 1·78 per thousand was pitted by small-pox; out of 508 children whose vaccination was doubtful 30 were scarred with small-pox, or 59·0 per thousand; and of the 2,837 children who had no vaccine scar, 1,010 were scarred by small-pox, or 360·0 per thousand. Children, therefore, vaccinated in the average way were scarred by small-pox two hundred times less than those who had not been vaccinated.

Chapter III.—Arrangements for Public Vaccination.

Arrangements for public vaccination.

We propose to consider these arrangements under the heads of (A.) the duties of guardians, (B.) of public vaccinators, (C.) of registrars, as imposed upon them by the Vaccination Acts and by the Regulations of the Council.

(A.) Duties of Guardians.

Each Union makes independent arrangements.

Each of the 39 districts into which the metropolis is divided for Poor Law purposes made its own independent arrangements for the performance of public vaccination, and in only one instance did the same gentleman hold contracts in two unions. We found in many parts of the metropolis considerable inconvenience arising from this independence of arrangement, children requiring public vaccination having to be taken some considerable distance to the station of their own union, while the station of a neighbouring union was much nearer to their residence. This was an inconvenience that affected many thousand families in London, and in some places had proved a serious hindrance to the acceptance of gratuitous vaccination by the

* We could only of course take cognizance of children who had *marks* of small-pox. Whatever other children had had the disease (and some such certainly had, especially among the vaccinated) it had been in so mild a form as to leave no traces.

public.* Another inconvenience was that, the stations being almost uniformly the residences of the public vaccinators, those of different unions were often placed close to each other near the boundaries of the respective parishes in such a way that, while the station of either vaccinator would have been well supported if it got cases from the entire neighbourhood, it was in fact very badly supplied with children through the division of the local vaccination between it and the station immediately adjacent. Examples illustrative of these statements will be found abundantly by a reference to the map accompanying this report.

DUTIES OF GUARDIANS.

The duties of guardians consist in the appointment of vaccinators and of their stations, and in regulating their attendances; in the issuing of public notifications, and in the institution of proceedings for the enforcement of vaccination.

Appointment of vaccinators.

For the 39 unions of the metropolis, 232 vaccinators were appointed.† In the parishes of St. George Hanover Square, of Paddington, of St. James Westminster, of Hampstead, and of Clerkenwell, the vaccination arrangements were made independently of the Poor Law medical arrangements. In many other unions, while the Poor Law medical officers were, as a matter of course, appointed public vaccinators, other practitioners also held contracts for vaccination. In nearly half the unions the parochial medical officers were the only public vaccinators. The performance of public vaccination at the surgeries of medical men who were parochial surgeons was often very imperfectly dissociated from the receipt of parish relief. This resulted, not so much from the vaccinator being the parochial surgeon,‡ as from the place and time of attendance for vaccination being usually identical with those fixed for the attendance of pauper cases of sickness. In the towns of Deptford and Woolwich it was plain that this confusion was resented by the public, who took their children almost universally to the surgery of that vaccinator who had no parochial appointment. In St. George East many parents refused to let their children be touched by the public vaccinator himself, who was the workhouse surgeon, but made no difficulty in applying at the surgery of his deputy, who had no parochial appointment. In St. John's Westminster and St. Saviour's Southwark the vaccination was principally performed by one contractor in each, who held no parochial appointment. The extreme of association between poor

Public vaccination associated with parish relief.

* Examples :—The station of Kensal Green, belonging to a detached part of Chelsea parish, is the most accessible for many residents in Paddington, Kensington, and other unions, and numbers of extra-parishioners are vaccinated at the Chelsea station. The station of the late Mr. Jones, a well-known vaccinator in Soho Square, was found so convenient by residents in other unions that 32 per cent. of his entire vaccinations were of children not resident in the Strand Union. The vaccinating station of St. Giles and Bloomsbury is half a mile distant from the poorest parts of the latter parish, while two public vaccinators of St. Pancras have stations within ten doors of the boundary of Bloomsbury, either of them incomparably more accessible than the St. Giles's station to the poor neighbourhood in question. Persons living at North Woolwich, surrounded by an Essex union, have to cross the Thames to get to the public vaccinator of their own union at Woolwich proper.

† And at the time of our inspection, small-pox being prevalent, a few unions had made additional temporary appointments, and one had made six permanent additional appointments, which are not considered in the statements of the text.

‡ As vaccination has been usually left to the personal exertions of the public vaccinators, almost unaided, it has of course been desirable that the person appointed to this office should possess the confidence of the poor. The district medical officer has doubtless, generally, the best claim to this confidence. But this does not affect the above argument, or explain why some district surgeons now only hold their medical appointments for the sake of their vaccination contracts.

1. In London, by Dr. Seaton and Dr. Buchanan.

law relief and public vaccination was observed in St. Giles's, where the only vaccinating stations are the workhouse and some adjacent premises used for parish purposes. Here it had been regarded as desirable to dissuade people from obtaining vaccination at the public cost, if they could be shamed into paying a private practitioner for it.

It appeared to us that the office of public vaccinator was made far too commonly a mere appendage and perquisite to the office of district surgeon. From its minimum payment being fixed by law, guardians are now no longer able to get tenders for the lowest charge at which their vaccination will be undertaken. Although this minimum payment is in our judgment fixed at a point too low for the proper remuneration of the numerous and delicate services demanded of a vaccinator, the rate is nevertheless considerably higher than that given for other medical services in some unions. The guardians of such unions had found that the perquisite of vaccination enabled them to underpay their medical officer for his attendance on the paupers. Wherever this view was taken the vaccination arrangements were made entirely subservient to the arrangements for pauper medical relief, and were rarely such as they should have been if the interests of public vaccination alone had been consulted.

Appointment of stations.

The 232 vaccinators of the metropolis were appointed to attend at 260 stations for the performance of public vaccination. The stations were in almost all cases the private residences or surgeries of the public vaccinators. The workhouses, or some premises used for other parish purposes, were also in several unions named as stations*; but, as a rule, few patients besides paupers obtained their vaccination at such stations. In other instances the surgery of some other medical man, or a chemist's shop, was used as a vaccinating station; arrangements which were found to conduce to much irregular vaccination by deputy. The choice of a station was habitually left entirely to the contractor. In one or two instances the vaccinator had himself incurred expense in fitting up a separate and conspicuous station.

The rooms that were used for the purposes of vaccination frequently afforded very inadequate accommodation. They were very often so small that a dozen persons could not have been received into them at once.

The appointment of many or of fewer stations in a union did not appear generally to depend on considerations of convenience as to the distance the children would have to be brought, it being a matter of frequent occurrence to find two stations of the same union close to each other in the same street, and three or four stations within five minutes walk of each other.† In scarcely any instance would a child have had to be taken any really long distance to the station of its own union. But very often the station of a neighbouring union would have been far more convenient.

Attendances of vaccinators as arranged by contract;

The number of attendances for the performance of vaccination at the stations, arranged between the public vaccinators and the guardians, amounted to 913 every week, or 47,476 a year. The annual number of children vaccinated by these vaccinators, on the average

* The union of St. Olave had appointed their vestry-room, a commodious and well-known place, dissociated from pauper management, as a vaccinating station.

† See examples in the map at p. 118 :—Three stations of St. Saviour's, Southwark, are within 100 yards of one another, and all within 100 yards of the great central station of the National Vaccine Establishment at Surrey Chapel, upon which two at least of them were constantly dependent for their lymph supply: three stations in another part of the union are still closer to one another. There are no less than three stations in Dean Street, Soho, &c. &c.

of the two years 1861-62, was 46,067. T
cases, therefore, at each vaccinating station on each vaccinating day, was something less than one child.*

Nos. 1–4. *Local Inquiries as to Vaccination.*

As regards twenty vaccinators, either from want of contract or absence of definite arrangements, no attendances were directed, and it appeared to be assumed that the vaccinator would operate at any time, on application. In respect of 50 public vaccinators, arrangements were made by contract for weekly attendances at their stations. The rest undertook to attend twice or three times a week, or daily. These arrangements, however, were often modified to some extent by subsequent announcements, so that the vaccinating arrangements as last agreed on stood as follows:—60 vaccinators undertook to attend once a week at 73 stations, 58 vaccinators to attend twice a week at 63 stations, 10 vaccinators to attend three times a week at 10 stations, while 84 vaccinators undertook to attend every day at 93 stations.

1. In London, by Dr. Seaton and Dr. Buchanan.

As settled by subsequent announcements;

The practice of the contractors was by no means strictly regulated by the prescribed arrangements. Many who contracted to give several attendances a week had found by experience the advantage of restricting their vaccination to a single day. Others, who contracted to attend once a week only, had, in their anxiety to give what they thought facilities for vaccination, extended their attendances to several days or even to every week day. Upon examination of the actual practice of the vaccinators, it was found that nearly two thirds had adopted some modifications of the arrangements which had been concluded between themselves and the guardians. In the end, then, the actual practice of the vaccinators was as follows:—77 vaccinators kept their attendances pretty strictly to one week day; 44 vaccinators attended either regularly on two days of the week, or more on two days than on the rest; and the remaining 111 vaccinators attended on several days, or on every day of the week, and usually at any hour when they were at home. While some few stations had been disused, some vaccinators had adopted other stations in addition to those instituted by the guardians.

As given in actual practice.

It has been said that by the published arrangements a single child would be the average attendance at each vaccinating station on each vaccinating day, but owing (1) to the increased number of attendances given in practice, (2) to the custom of some, even of large vaccinators, to do the operation at the children's homes, and (3) to the considerable proportion of the entire vaccination done at some few prominent stations,† the average number of stational vaccinations for the bulk of the London stations certainly did not exceed half a vaccination on each vaccinating day. Now, under the recommendation of the Council, the average attendance on each vaccinating occasion should amount to at least 10 children. Experience has amply shown that thus only can opportunities be afforded for the vaccination of children, who are brought to the station at announced times, direct from the arms of other children under proper conditions for selecting lymph. The annual number of children vaccinated at each station furnishes there-

Undue subdivision resulting from these arrangements.

* Some vaccinators undertook to attend for two hours on each occasion, and some few were advertised to attend morning and evening. These are only reckoned above as single attendances, though of course such arrangements throw as much obstacle in the way of arm-to-arm vaccination as a further multiplication of attendances would do.

† In twelve unions examined by one of us, more than one third of the entire vaccination was performed at six stations out of 57 advertised to the public. The habit of vaccinating at the homes of parents, which should of course be discouraged in a town district, was promoted in the St. Saviour's Union by a higher fee paid for all children thus vaccinated than for those attending at the station.

1. In London, by Dr. Seaton and Dr. Buchanan.

fore a primary test of the efficient working of that station: and an annual attendance should be secured of at least 500 children, vaccination being conducted on one week day. In a large town there cannot be any real difficulty in making every public vaccinating station answer to this test. But through the unwise sub-division of public vaccination in London, it had resulted that only 19 out of the 232 public vaccinators obtained habitually an annual number of vaccinations reaching the prescribed standard for an efficient station. There were 66 vaccinators who got between 200 and 500 cases a year; 51 who had between 100 and 200; 43 who had between 50 and 100 cases; and 31 who, in their capacity of public vaccinators, vaccinated fewer than 50 children annually.

The Pimlico station of the parish of St. George's Hanover Square answered perfectly to the test applied, and is, in its arrangements, a model of what a London vaccinating station should be. Between 700 and 800 children are here vaccinated annually, vaccination being carried on in a very commodious room every Monday morning and at that time only. No child had for years been vaccinated otherwise than direct from the arm; and the opportunities of selection of lymph were ample. One of us has repeatedly visited the station at various times, but never without finding several children from whom lymph might be taken. The station at King Street, Woolwich, will bear comparison with this type in the manner in which uninterrupted arm-to-arm vaccination is kept up, with the proper number of cases from which to select lymph. The same may be said of the stations at 39 Bethnal-green-road, at 337 Hackney-road, at 46 Marsham-street, Westminster, at 10 Lissongrove, at 16 Upper Berkeley-street, Marylebone, and at 162 Caledonian-road, as regards the vaccinations performed thereat on one of the two week days on which they professed to be open.*

Stations with more than 500 vaccinations yearly.

Others of the 19 vaccinators whose yearly vaccinations exceeded 500, had injured the opportunities of their stations by the number of days employed for vaccination. Thus, at the stations, 8 York-road, Lambeth, and 1 Kingsland-road, although so well provided with cases that all the vaccination might be done in the typical way, a considerable number of children annually failed to get arm-to-arm vaccination, or got it under circumstances of disadvantage as to selection, through the use of a second or a third day in each week.

In other instances capital opportunities of making first-rate stations were completely thrown away, owing to the practice of vaccinating at all times indiscriminately. Thus, at the station, 14 Kennington-green, where there were upwards of 700 cases a year, arm vaccination was by no means uniformly maintained. The vaccinator of No. 1. district in Bethnal-green, with 540 cases as his yearly average, professed to attend at his station twice every day, but did in fact almost all his vaccination at the homes of his patients, so that with every opportunity of arm vaccination it was quite the exception for the operation to be so performed. And in Mile End Old Town, where restriction of the number of contractors had thrown 820 cases yearly into the hands of one vaccinator, the power of making a magnificent station was abandoned for the most objectionable plan of vaccinating by deputy

* At the station in Marsham-street 600 out of 850 cases vaccinated annually were done on Mondays. The disadvantage of the second day was seen in the Thursday vaccination, the succession of arm-to-arm cases on that day being sometimes broken, and the opportunity of selection being far too limited. At the station in Berkeley-street 500 out of 570 cases in the year were done on Mondays, 70 cases a year only being vaccinated on the Thursday, and about half of these were done under circumstances which necessitated the use of preserved lymph.

at any time at the surgery of any medical man who chose to register his vaccinations to the public account.

From the operation of the causes described it has happened that several of the stations of the second class, those having between 200 and 500 cases yearly, afforded more of sustained arm-to-arm vaccination than some of the stations that had larger attendances. By keeping strictly to one day in the week, vaccinators with even 300 cases a year had contrived to keep up arm-to-arm vaccination, with very little intermission, for long periods. But with so few cases it was always found that some private manœuvering was required to ensure unbroken attendance. A wet morning, for example, would easily stop arm-to-arm vaccination unless the contractor sent off to some child who had been vaccinated, and to some other child who might be vaccinated, and got them together for the sake of keeping up the unbroken chain of fresh lymph. While we feel how much praise is due, in such cases, to the vaccinators, for their diligence and zeal to make the best of their arrangements, it appears to us that by the very necessity for such contrivances the arrangements themselves are condemned. There are two ways in which the attempt to eke out scanty attendances in the manner described can scarcely fail to be prejudicial to the full efficiency of public vaccination. First, there is the encouragement to use the lymph of second-rate vesicles, when the alternative is the employment of preserved lymph; and, secondly, the importance of the station and of the operation is lowered in the eyes of the public, who come to regard the vaccination of their children as a private favour done to the vaccinator.

Stations with 200-500 vaccinations yearly.

Many of the 66 vaccinators whose cases were between 200 and 500 a year did not, however, restrict their attendance to one day weekly, and these had a proportion of vaccinations with preserved lymph varying from one-tenth to nine-tenths of the whole.

Of the 125 vaccinators whose yearly operations fell below 200, it will be sufficient to say that not one was able to keep up a continuous vaccination from the arm, although some operators, knowing the value of this method, had contrived by private management to get the great majority of their cases so vaccinated. Others of these vaccinators cared nothing for arm vaccination, and habitually did much of their vaccination from house to house.

Stations with less than 200 vaccinations yearly.

We found the greatest difference as to the way in which the respective vaccinators regarded the performance of vaccination and the observance of various points essential to its success. Many, whose opportunities were limited, yet by infinite pains got their children vaccinated in a better way than others to whom larger opportunities presented themselves, while there were operators who administered vaccination as they would a dose of medicine, at any time, to any comer, and expected, in their own words, that "it might take or "might not; you could not exactly tell which."

Still further to test the working of the existing arrangements for public vaccination, as regarded the facilities they afforded for the proper performance of the operation, one of us, putting himself for the time in the position of a person desirous of public vaccination, visited 38 out of 57 vaccinating stations in 12 unions, at the time publicly announced for the performance of vaccination. These 38 included the six stations of those unions where above 500 a year were vaccinated, 14 stations where the vaccinations numbered from 200 to 500 annually, and 18 stations which had fewer than 200 yearly vaccinations. What follows may be taken as representing, but too favourably, the average of London in respect of vaccination attendances.

Opportunities for arm vaccination, tested by actual visits to stations.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

Of the six stations at which above 500 are vaccinated the attendance was as follows:—At the Pimlico station, before mentioned, were twelve children from whose arms lymph could be selected; at the Marsham-street station there were also several children. At one station there was one child only, and at the other three stations there was no child to furnish lymph, though on a second visit to one of them two children were found. At two of the four stations last referred to vaccination was offered on two days a week, at one on three days a week, and at the other on every week-day.

Of the 14 stations the vaccinations at which were between 200 and 500 a year, four were found where vaccination might have been done from the arm, there being four children at one station, two at another, and one at each of the others. The vaccinators of these four stations strictly adhered to the plan of attending once a week only. At nine stations vaccination might have been performed with lymph preserved in some manner, but there was no child present from whose arm lymph could have been directly taken. What assurance of successful result was afforded by the vaccination here offered may be judged of from the fact, that at one station it was proposed to use points chiefly coated with blood, and at another station the material to be inserted was a mixture of glycerine and lymph. From the remaining station of this group the vaccinator was absent, without a qualified substitute, on a first visit, and on a subsequent visit there was no lymph.

Of the 18 stations where fewer than 200 vaccinations were each year performed, two were found at each of which one child was present, from whose arm the vaccination might have been performed; at 13, no child was present, but there was preserved lymph with which the operation might have been done; at one station there was no lymph; and at the two remaining stations, visited each on two separate days, there was no qualified vaccinator on either day, and at one of them there was also no lymph.

There were, therefore, but nine of the 38 stations at which vaccination could be had from the arm under any conditions, and but three at which the number of children from whom lymph could be selected amounted to as many as four.

Notification of arrangements for vaccination.

Sixteen unions only of the 39 into which the metropolis is divided professed to notify regularly to the public at large the arrangements for public vaccination. In times of small-pox, however, most of the other unions had issued notices of these arrangements.

The manner of notifying public vaccination in ordinary times was generally by placards issued every year or two. Eight of the 16 unions had fixed in public places notice-boards with the vaccination arrangements, but in several instances the arrangements thus announced had been superseded by other arrangements, not so notified. And the placards in four unions, while giving a general warning to parents to obey the Vaccination Acts, failed to announce what the district arrangements for public vaccination were. In about half the unions that advertised their arrangements, the information conveyed by this means to the public was, as regarded several vaccinators, at variance with the times announced to parents by the Registrars, and both differed from the arrangements which the vaccinator himself actually adopted in practice.*

*An example of the diversity of arrangements announced to the public—an extreme example, it is true, but not a solitary one—is the following, from St. Luke's Chelsea. A contractor's schedule arranges for his attendance on each Tuesday and Friday from

Ten of the London unions had appointed (under the 24 & 25 Vict. c. 59.) an officer with general instructions to take proceedings under the Vaccination Acts. This officer was, in the several cases, the assistant overseer or the relieving officer; the sanitary inspector or the medical officer of health; the registrar or the public vaccinator. Several of these unions had given publicity to this appointment. Eight other unions had a designated officer, "who would be appointed" to take proceedings in case a complaint were made. In nine unions proceedings had been inaugurated by the service of a warning upon neglectful parents, and among these the parish of Paddington had carried out the system of notices in the most regular and efficient way. Usually the warning thus given was obeyed. When the notice was neglected, some unions took no further action; four had taken the first step towards summoning the offender for his default, but had found the evidence break down, the non-registration of the child's birth being the most frequent reason for abandoning prosecution. Two unions only, Paddington and Poplar, had, through their appointed officer, taken proceedings, and pushed them to the imposition of a fine upon the parent. A public vaccinator of the Greenwich Union had done the same thing in his personal capacity. A feeling existed in some boards of guardians against prosecution of neglectful parents by the parochial authorities, as calculated to excite local prejudice and ill-will, and thus to hinder rather than promote vaccination. While many of them would not have demurred to such proceedings in the abstract, they considered that these measures ought to be taken by a public prosecutor, independent of local ties.

Proceedings under Vaccination Acts.

B. Duties of Vaccinators.

Duties of Public Vaccinators.

These, by contract and regulation, are (*a*) to attend at appointed times in person or by legal deputies for the purposes of vaccination and inspection; (*b*) to vaccinate in accordance with instructions; (*c*) to inspect results; (*d*) to keep registers of their proceedings; and (*e*) in cases of successful vaccination to give certificates to the parents and registrars respectively.

(*a*) *Attendances for vaccination and inspection.*

Deputies.

The duties of vaccination and inspection were said to be performed altogether in person by 132 of the vaccinators. Ninety vaccinators stated that they performed some of their vaccinations by deputy, and a few others, who alleged that they always vaccinated in person, employed deputies to ascertain from house to house the results of operations. In no instance had the deputies been properly admitted by the local authorities, or their qualifications inquired into, as the regulations direct. We found that of the deputies employed to vaccinate 36 had no medical qualification whatever, several of them being merely pupils, or employed as shopmen; 18 were possessed of some medical diploma; while 36 only, most of whom were partners of the contractors, had the legal qualifications of a deputy. The extent to which the

9 to 10 o'clock; a placard issued by the guardians announces that this contractor will attend daily at 9 a.m.; the Registrar announces that he is to attend on Thursdays at half-past nine; and his practice is to vaccinate chiefly on Mondays, while on his own surgery he is advertised to attend every morning from 9 to 10. Again, a vaccinator for St. John's Westminster, who had no contract with the guardians, was advertised by them to attend at his surgery daily; the Registrar gave notice that he attended on Mondays and Thursdays; a plate on his door informed the public that he vaccinated on Mondays, Wednesdays, and Fridays; while in point of fact it was only at times that he had lymph to vaccinate at all.

services of deputies were used (as stated to us) varied considerably, some contractors using their services only occasionally, while most of the deputy vaccinators did a large share, and in three instances (in the case of partners) the whole of the vaccinations. Twelve contractors performed a considerable majority of their vaccinations by unqualified deputies.

1. In London, by Dr. Seaton and Dr. Buchanan.

In the above statement, two unions are excluded from mention, in each of which an extraordinary system of vaccination by deputy prevails. In Stepney the vaccinators appoint, with the consent of the guardians, their own stations, which are the parochial dispensary, the surgery of one of the contractors, and the surgeries of five other medical men, the deputy vaccinators. The contractors undertake to attend at these stations at fixed times, and the guardians announce these attendances by placard. All persons applying at irregular times at the surgeries of the deputies are vaccinated by the deputy or his assistant. In several instances the contractor does not even attend at his appointed times at the surgery of his deputy, but leaves all persons applying there to be vaccinated by the deputy; and, moreover, vaccination has in practice been done by other medical men who were not advertised as deputies, and such vaccinations have been entered in the register of a contractor as performed on the public account.

In Mile End Old Town the system of deputies is carried to a much wider extent. There any "qualified" practitioner may vaccinate any applicant, or may seek out any cases at their homes, and may put them down to the parish account, in one or other of the public vaccinators' books. Such vaccinations are certified to have been performed by the public vaccinator. This plan is assented to by the guardians, although, except in one instance, they take no cognizance of the individuals who thus act as deputy vaccinators.

(*b*) *Performance of Vaccination.*

Mode of vaccinating.

We found that of 229 vaccinators whose practice we had an opportunity of inquiring into, 157 operated by puncture, and 72 by abrasion, scratch, superficial cuts, multiple punctures, or some other manner of inserting lymph at several points for each spot operated on.

Of those who operated by puncture, 40 made three insertions, some of them occasionally making a smaller number; 60 said that they made four, but sometimes less than four; 57, that they made more than four insertions, several of these making habitually six or eight. It was not unfrequently stated that fewer punctures were made when dried lymph was used than when vaccination was done from the arm. The punctures made, so far as we had an opportunity of determining, either by seeing the operation performed, or by observing its results in the vesicles or their scars, were for the most part of an extremely superficial character, not producing with constancy, even when fresh lymph was used, the "good sized vesicles" which the instructions require. Whether from this cause or from want of activity in the lymph, some vesicles produced by this means were almost ridiculously diminutive. It is our opinion that fully half of those who operated by puncture were satisfied with an amount of local effect inadequate for satisfactory protection. Some vaccinators, indeed, professed their dread of any local irritation, and had an absolute horror of any constitutional disturbance resulting from vaccination. On the other hand, the results produced by puncture, as employed by some vaccinators, left nothing to be desired in the character of the vesicles and their resulting scars.

Insertion by abrasion, or by some similar method, was by ten vaccinators limited to two spots on the arm; by 34 it was extended to three spots; by 21 to four; and seven vaccinators removed the cuticle from five or six places. The local effect resulting from this method of operating depended of course upon the amount of surface abraded, and it was quite possible on two or three spots to produce all the local effects required. Some of the finest cicatrices, and the completest local results of vaccination that we have ever witnessed, have been in children vaccinated in this manner. On the other hand, the scars resulting from vaccination by abrasion, in the practice of some vaccinators, were not above the ordinary size of puncture cicatrices; and we saw many children who were said to have been vaccinated in this way who were insufficiently protected. But, on the whole, we were satisfied that those operators who vaccinated by abrasion, scarification, or other similar method, produced the requisite amount of local effect, much more generally than those who operated by simple puncture; the cicatrices produced by them being, as a rule, of better quality both in respect of size, and of the depression and characteristic pitting that indicate deep affection of the skin.

Success or failure.

Of the degree to which vaccinators succeeded or failed in their operations we are able to give but a very imperfect account, because (1) by a large number of contractors the results were not always properly ascertained, and (2) most of those who did duly observe the results omitted to make in their registers a due record of their failures. In scarcely a third of the registers was any notice taken of the unsuccessful cases, and it was only in a portion of these that we could rely for the thorough accuracy with which the record had been made.

We found, from registers which had been accurately kept, that the ratio of success, in those districts where arm vaccination was continuously maintained under satisfactory conditions, contrasted in a striking manner with the results in other districts where a great proportion of the vaccination was performed with dry lymph. The former attained nearly that degree of success which Mr. Marson states should always attend proper vaccination (failures not more than one in 150), the average failures being under one per cent. of the operations; while in the latter districts failures were shown amounting to 10, 12, and even 15 per cent. of the cases operated on. We often met with unvaccinated children in the schools who said they had been "tried" once, twice, three times without result, and invariably the operation (whenever we had the opportunity of ascertaining the point) was found to have been attempted with preserved lymph, generally by "putting in the bones," as the children called the use of points. Those vaccinators who used preserved lymph by rubbing it into an abraded surface had the fewest failures, but even these never obtained the degree of success that attends well-performed arm-to-arm vaccination.

Degree of success in certain cases.

Four of the 75 registers gave us further information as to the degree of the success obtained. From the books of three such vaccinators the following data are derived, showing the exact degree of success in 1,754 successful vaccinations done exclusively from the arm.

[redacted]or more vesicles were obtained in 88·7 per cent. of the cases
[redacted]d on, three vesicles in 6·2 per cent., two vesicles in 2·9 per
[redacted]nd one vesicle in only 2·2 per cent. of their successful cases.
[redacted]itual mode of performing vaccination by these three operators
[redacted]ree punctures on each arm, or by four or five on one arm, if
[redacted]ired to have one arm only operated on; and there were in
[redacted]cles produced in 6.43 per cent., and five vesicles produced
[redacted] cent. of the total successful vaccinations. With this

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Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

success we had the opportunity of comparing the experience of one of these same vaccinators in certain of his cases where he had had occasion to operate with preserved lymph. Out of 24 children so vaccinated, the operation failed altogether in 10; one vesicle only was produced in five; two vesicles in three; while three, four, and five vesicles were produced on one, two, and one children respectively; and in two children only out of the 24 were all six insertions productive of their intended results.*

Period of taking Lymph.

The instruction to take lymph either just before the formation of the areola, or at the latest not more than 24 hours after the areola has begun to form, appeared to be very generally observed. By all the large stational vaccinators this rule was carefully regarded. Out of 175 vaccinators we met, however, with eleven who took their lymph sometimes, and with three who took it habitually, at a later period than the instructions warrant. One of these considered that the vesicle was not mature until there was a large areola round it. All those who took lymph at a late period were house-to-house vaccinators. There were several operators whose practice in this respect we did not ascertain.

Use of Lymph from secondary vaccination.

By nine or ten vaccinators the lymph of re-vaccination had been employed to vaccinate. This had been done sometimes under pressure of deficient supply of primary lymph; or else because the lymph of re-vaccination had been considered good enough to do other re-vaccinations with, though it would not have been employed for primary cases.

Supply of lymph.

Of 221 vaccinators, 123 stated that that they maintained their own stock of lymph, or not more than once or twice a year had recourse to other lymph than their own, several changing their source only if they were dissatisfied with the results of their own lymph. But, by the large majority of these contractors, this was only effected by some method of storing. The remaining 98 vaccinators were to a considerable extent dependent upon extrinsic sources, getting lymph from their friends, usually neighbouring public vaccinators, or (in 57 of the 98 instances) having frequent recourse to the National Vaccine Establishment for the maintenance of their vaccination.

Storage of lymph.

Several vaccinators who, to avoid the frequent chances of failure they found attend the use of dry lymph, were in the habit of endeavouring to keep lymph moist as long as possible on glasses or the stoppers of vaccinating bottles, were unmindful of the instruction with regard to the time within which lymph so kept should be used. Of 34 vaccinators adopting this plan, there were 23 who did not limit themselves to the time directed. Ten of these said they always used the lymph within 48 hours of taking; but 13 did not hesitate to use it after it had been kept even longer than this, and three of them confessed to using it after it had been kept a week. Indeed one vaccinator expressed his opinion that the lymph being ammoniacal and putrid was no obstacle to its success nor to the regular course of the vaccine disease that was produced by its insertion.

(c) *Inspection of results.*

Inspection of results.

The extent to which children were brought back for inspection variously stated, the circumstance that determined parents to the performance of this duty appearing to be the strict ob

* Vaccinators who habitually do much of their vaccinations with pres would doubtless have got a somewhat higher degree of success with its gentleman, with whom it was the rare exception to vaccinate otherwise arm.

or otherwise of stational vaccination. Generally it was said that the majority, or the great majority, were presented on the day week, and many vaccinators had scarcely anything to complain of in this respect. One vaccinator, by earnestness and strict system, got his cases, with little exception, brought for inspection on the fourth or fifth as well as the eighth day. But most vaccinators were subjected to great trouble and to serious augmentation of their difficulties with regard to lymph-supply from the omission of parents to bring their children back at the appointed time. The proportion of omissions was said by many of them to amount to a quarter or a third, and by some to a half or even two-thirds of the children vaccinated. When vaccination was done at the homes of the children the examination of results had, as might be expected, to be made almost universally in the same way. But, whatever the trouble this omission of parents might entail, most vaccinators assured us that a case of vaccination was never considered and returned as successful unless the results had been actually ascertained by themselves or their deputies. Many, though generally adopting this mode of ascertaining results before reporting them, by no means did so uniformly, taking in some instances as sufficient evidence a statement of parents or neighbours, and in other instances reporting without any evidence at all. And lastly, there were certain vaccinators who habitually, without any inquiry, assumed success whenever a child was not brought back: among these vaccinators were some who vaccinated large numbers, and did not see again more than half the cases operated on. A large number of the vaccinations of which the success was thus assumed were vaccinations which had been performed with preserved lymph.

(*d*) *Registers of vaccination.*

Contractors' registers.

In one union the vaccinators kept no register, in another there was great difficulty in finding any, and in a third the quarterly bills constituted the only record of public vaccination. We found most of the registers very imperfect, particulars required by the contracts and by the regulations being omitted altogether. Thus, of 205 registers which we examined, 75 only professed to make any entry of unsuccessful cases. Thirty-nine registers only distinguished duly revaccinations from cases of primary vaccination; and 10 only made systematically the important entry as to the source of lymph employed in each vaccination. A very few others did this partially or for private reference. Dates were often omitted or entered irregularly, and the books were in many instances only made up from time to time as statements of accounts. The registers of the two public vaccinators of St. George, Hanover-square, of Dr. W. E. G. Pearse of Westminster,* of Mr. Blenkarne in the City, of Mr. Welch of Bethnal Green, and of Mr. Hunt of Newington, were models of what vaccination registers ought to be, and they were the only registers that were in every respect properly kept.

Generally the registers of the vaccinators underwent no other examination than that of the union clerk each quarter for payment of the account; but several boards of guardians required them to be presented at more frequent intervals, or had a weekly or fortnightly

* Dr. Pearse's register was kept for the National Vaccine Establishment, of which he is a member.—The board of guardians of St. Mary Newington had provided an improved form of register, with columns for re-vaccination and for source of lymph. Five vaccinators out of six in this parish had properly made the first of these entries, while one only had properly shown the source of lymph.

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abstract of them presented at the board meetings. Seldom, however, were the registers themselves scrutinized by the guardians.*

(e) Certificates of successful Vaccination.

I. In London, by Dr. Seaton and Dr. Buchanan.

Of 191 public vaccinators of whom inquiry was made respecting the giving of certificates of successful vaccination to parents, 136 replied that they gave that certificate always or to all parents who brought their children back for inspection: 27 vaccinators gave the certificate, but not regularly; while 28 either did not give the certificate at all, or only when they were specially asked for it.

Delivery of certificates.

The practice of 217 vaccinators as to giving duplicate certificates of successful vaccination to the Registrars was as follows:—13 did not send them at all; and 15 others forwarded them at irregular times, or not invariably; and 189 stated that they transmitted them all to the Registrars. But it is certain that some of these must have spoken rather of a recently adopted or of an intended practice than of a habit steadily pursued, as the statements were not always reconcileable with the entries in the books of the Registrars. The guardians in six unions had required evidence of the regular delivery of the legal certificate as a condition of payment for vaccinations, and such a check appeared to be required in several other unions. The Registrars often complained loudly, and with justice, of the difficulty and delay in getting certificates, and of the imperfect manner in which they were filled up. On the other hand, the vaccinators complained as loudly, and in our opinion with equal justice, of the unnecessary cumbrousness of the present system of duplicate certificates.

C. DUTIES OF REGISTRARS.

DUTIES OF REGISTRARS.

These consist in the delivery to parents of the statutory notice requiring vaccination, in the keeping a minute of having delivered this notice, and in the registration of certificates of successful vaccination. All the 135 Registrars of the metropolis, with one exception†, gave to parents the notice required by law, upon their registering the birth of their children. The notices, as given by 24 Registrars, were informal, from omitting or giving irregularly the information with regard to the attendances for public vaccination; and many other Registrars gave a part only of the vaccination arrangements existing in their sub-districts.

Seven Registrars had omitted altogether to keep their registers of successful vaccination, and ten others omitted to make in their books the minute of the delivery of notice, using the book only for entry of certificates transmitted to them. By the remaining 118 Registrars

* The return made annually to the Poor Law Board of the numbers vaccinated by each vaccinator is compiled from the registers, the cases being distinguished into those above and those below one year of age. In 20 of the unions this compilation is done entirely at the clerk's office; in eleven unions the numbers and the ages are returned in the first instance by the vaccinators themselves; in the remaining unions this point was not inquired into. On comparing the returns with the registers we found in nearly half the unions errors of some magnitude, and that the return was in some cases altogether unreliable.

† A few occasionally omitted the notice in the case of better-class people. The Registrar who omitted the formal notice had substituted for it a verbal notice, giving the parent at the same time one of the duplicate certificates filled in ready for signature of the vaccinator, with instructions to return it, when signed, to him; and the plan had been remarkably successful in securing the registration of the certificates. The attention of this Registrar being called to the legal consequences which resulted from the omission of the statutory notice, he undertook that this should always be given in future.

the registers were all used correctly, and were properly made up to a recent date.

Certificates received by the Registrars were duly entered by all those who kept their register books.* Owing, however, to circumstances that we have already explained, the registration of successful vaccinations was very imperfect, ten only of the 118 registrars who kept their books having succeeded in registering the vaccination of more than half of the children born in their sub-district.† The proportion of certificates received in respect of children born in the sub-district was usually one-third or one-fourth of the births. In some places it was as low as one-eighth or one-tenth, and an extreme instance may be cited of a Registrar who had received a total (including children born in other sub-districts) of seven certificates for every thousand entries that he had laboriously made from his birth book into his vaccination register.

Chapter IV.—The recent Epidemic of Small-pox.

Small-pox in London.

The epidemic of small-pox that has recently visited London began in the middle of the year 1862, culminated in the second quarter of 1863, and at the date of this report the disease is only slowly returning to its standard of non-epidemic years. The following table, compiled from the returns of the Registrar-General, shows its progress during each quarter in the five sub-divisions of the metropolis :

Deaths from Small-pox in Quarter ending	In London (Population 1861 2,803,989).	In Groups of Districts (Population 1861).				
		Western (463,388).	Northern (618,210).	Central (378,058).	Eastern (571,158).	Southern (773,175).
March 1862	37	1	11	1	15	9
June 1862	39	2	5	4	16	12
September 1862	77	2	14	1	37	23
December 1862	192	9	57	14	79	33
March 1863	422	49	126	34	139	74
June 1863	788	121	199	115	210	143
September 1863	512	78	154	86	113	87
December 1863	299	81	108	57	38	53
Total two years	2,357	293	674	306	647	437
And after distribution of the deaths in the Small-pox Hospital						
The Totals become	2,343	355	446	356	697	494
Or per 100,000	87	76	72	94	121	64

The total mortality from small-pox from the commencement of the epidemic to the end of 1863 was 2,281, or upwards of 2,000 in excess of the number of deaths that usually occur in London in a similar time from sporadic small-pox.

* And sometimes certificates also that should not have been entered, as in the case of adults and others born before 1853. One or two Registrars had lately omitted to enter certificates in respect of persons born out of their union because the guardians had refused them payment in respect of such entries.

† Yet, by including vaccinations of children born out of their sub-districts, it had happened to four Registrars at least to register a larger number of vaccination than there were births in their sub-district in the same period.

Deaths from Small-pox in London in the Six Years 1858-63 inclusive.

Superintendent Registrars' Districts.	Area in Statute Acres.	Population in 1861.	1858.			1859.			1860.			1861.			1862.			1863.			Six Years.	
			Registered in Districts.	S. P. H.	Total.	Registered in Districts.	S. P. H.	Total.	Registered in Districts.	S. P. H.	Total.	Registered in Districts.	S. P. H.	Total.	Registered in Districts.	S. P. H.	Total.	Registered in Districts.	S. P. H.	Total.	Total.	Rate per 10,000.
LONDON	78,029	2,803,989	208	40	248	1,003	151	1,154	748	126	875	181	31	212	289	59	348	1,736	264	2,000	4,836	17·3
1- 6. West Districts	10,786	403,338	19	7	26	86	20	106	104	23	127	13	3	16	14	6	20	279	56	335	630	13·6
7-11. North Districts, corrected for S. P. H.	18,533	618,210	45	15	60	94	25	119	99	45	144	16	10	26	31	16	47	311	68	399	795	12·8
12-19. Central Districts	1,933	378,058	46	9	55	188	33	221	121	19	140	14	6	14	20	6	26	286	44	330	786	20·8
20-25. East Districts	9,220	271,118	61	6	67	256	37	293	146	11	157	89	6	95	147	17	164	500	33	533	1,409	24·6
26-36. South Districts	43,542	773,176	37	3	40	279	36	315	278	28	306	49	12	61	77	14	91	360	63	423	1,216	15·7
1. Kensington	7,374	185,960	2	2	4	36	7	43	37	10	47	7	2	9	3	2	5	31	20	101	209	11·2
2. Chelsea	865	63,439	6	2	8	2	4	6	21	4	25	2	.	2	4	2	6	40	10	50	97	15·3
3. St. George Hanover-sq.	1,161	87,771	3	2	5	8	2	10	9	6	15	2	.	2	1	1	2	50	8	58	92	10·5
4. Westminster	917	68,213	7	.	7	35	3	38	30	3	33	1	1	2	5	.	5	76	7	83	188	24·6
5. St. Martin-in-the-Fields	305	22,689	1	1	2	1	2	3	3	.	3	.	.	.	1	.	1	11	4	15	23	10·1
6. St. James Westminster	164	35,326	.	.	.	4	3	7	4	.	4	1	.	1	.	1	1	21	7	28	41	11·6
7. Marylebone	1,508	161,680	6	2	8	23	8	31	44	15	59	4	4	8	2	4	6	99	16	115	227	14·0
8. Hampstead	2,332	19,106	1	1	2	3	.	3	3	.	3	2	.	2	.	.	.	4	1	5	15	7·8
9. Paneras	2,716	198,788	22	4	26	37	10	47	32	19	51	7	2	9	19	4	23	31	27	108	264	13·2
10. Islington, corr. for S.P.H.	3,127	155,341	16	7	23	35	4	29	18	9	27	1	3	4	9	5	14	86	36	122	219	14·0
11. Hackney	5,923	83,293	1	1	2	6	3	9	2	2	4	2	1	3	1	3	4	41	8	49	69	8·4
12. St. Giles	245	54,076	7	.	7	21	1	22	20	.	20	1	.	1	4	.	4	52	6	58	112	20·8
13. Strand	172	42,979	1	.	1	15	4	19	10	2	12	1	.	1	6	1	7	38	5	37	77	17·8
14. Holborn	196	44,862	5	1	6	6	2	8	10	3	13	3	.	3	.	2	2	43	5	53	83	18·5
15. Clerkenwell	380	65,681	5	2	7	9	6	15	10	.	10	.	.	.	1	1	2	25	10	36	70	10·7
16. St. Luke	220	57,073	17	5	22	72	9	81	38	3	41	3	.	3	5	.	5	39	6	36	238	41·8
17. East London	153	40,537	1	.	1	30	3	33	11	1	12	3	.	3	2	1	3	20	3	23	75	18·5
18. West London	133	27,145	8	.	8	18	3	21	14	1	15	1	.	1	2	.	2	20	4	24	71	26·1
19. London City	434	45,555	2	1	3	17	5	22	8	9	17	2	.	2	1	.	1	13	2	15	60	13·2
20. Shoreditch	645	129,364	20	2	22	87	18	105	23	6	29	11	1	12	9	1	10	116	12	128	306	23·6
21. Bethnal Green	760	105,701	20	2	22	111	2	113	36	1	37	12	.	12	26	.	26	92	3	95	296	28·1
22. Whitechapel	406	78,970	4	1	5	57	10	67	21	1	22	28	4	32	33	3	36	70	4	74	236	30·0
23. St. George-in-the-East	243	48,891	1	.	1	16	4	20	13	1	14	14	.	14	34	8	42	19	5	24	115	23·6
24a. Stepney	676	55,672	.	.	.	23	1	24	14	1	15	6	1	7	22	5	27	61	8	69	142	25·1
24b. Mile-end Old Town	681	75,064	1	.	1	34	.	34	15	1	16	9	.	9	7	.	7	45	.	45	112	15·4
25. Poplar	2,918	79,196	15	1	16	28	2	30	24	.	24	9	.	9	26	.	26	97	1	98	203	25·6
26. St. Saviour Southwark	250	36,170	.	.	.	14	3	17	15	.	15	1	.	1	2	1	3	15	4	19	54	14·9
27. St. Olave Southwark	169	19,056	.	1	1	8	3	11	22	1	23	1	1	2	1	.	1	15	4	19	57	30·0
28. Bermondsey	688	58,355	7	.	7	14	2	16	26	2	28	4	2	6	24	2	26	45	5	50	133	22·8
29. St. George Southwark	282	55,510	5	1	6	69	5	74	34	2	36	4	.	4	18	3	21	57	1	58	199	35·8
30. Newington	624	82,220	4	.	4	45	6	51	37	2	39	6	.	6	13	3	16	48	6	54	170	20·6
31. Lambeth	4,015	162,044	4	.	4	50	11	70	58	11	69	11	.	11	6	.	6	88	14	77	237	14·6
32. Wandsworth	11,695	70,468	1	.	1	14	.	14	18	5	23	8	9	17	3	2	5	38	2	40	100	14·2
33. Camberwell	4,842	71,488	7	1	8	11	.	11	5	.	5	2	.	2	3	.	3	13	1	14	40	5·6
34. Rotherhithe	886	24,502	1	.	1	4	.	4	8	.	8	1	.	1	2	2	4	22	.	22	40	16·3
35. Greenwich	5,367	127,676	5	.	5	24	5	29	37	5	42	2	.	2	8	.	8	38	5	38	131	10·3
36. Lewisham	17,224	65,767	3	.	3	17	1	18	18	.	18	2	.	2	.	1	1	11	2	13	52	8·4

The eastern districts of London were earliest invaded, and suffered most from the disease. Next to them stand the central districts, while the southern parts of London, which suffered much from the epidemic of 1859–60, have as yet had fewer deaths from small-pox than any of the sub-divisions of the town north of the Thames.

Small-pox in various parts of London.

In a table on the 15th page we have examined more minutely the localization of the small-pox mortality during a period of six years,* distributing the deaths that occurred in the Small-pox Hospital among the districts from whence the cases were brought. A reference to this table will show that the metropolitan unions have suffered from small-pox to a very different extent, St. Luke's having the highest and Camberwell the lowest death-rate from the disease in the period reviewed. The difference in this respect between one London union and another is no safe index to the care or neglect therein of vaccination; for even if we should assume that the same proportion of deaths occurred in each among unvaccinated persons, the previous prevalence of small-pox, and the general sanitary conditions † of the district are important considerations in determining a high or a low mortality from small-pox.‡ It cannot be questioned that especial

* For ease of reference we subjoin the mortality of the metropolis from small-pox before vaccination was discovered. In the year 1700 the population of London within the bills of mortality was 665,200. The average yearly deaths from all causes in this population were about 20,000. Small-pox at its lowest point hardly ever caused less than 1,000 deaths annually, and in the year 1710 its mortality was 3,138 in London within the bills.

A century and a half ago, then, small-pox was fatal to at least 150 per 100,000 of the population of London yearly, and in some years carried off 470 per 100,000. At the present time the deaths from small-pox in non-epidemic years amount to less than 10 in 100,000, and in the severest epidemic London has witnessed for 20 years the small-pox deaths of the year have been 71 for every 100,000 of the population.

† It was a common remark among medical men with whom we conferred, that small-pox affected to an especial degree precisely those localities and streets where fevers are usually prevalent, and where nuisances were known habitually to exist.

‡ The following Table, compiled from the parliamentary return made by the Registrar General (No. 12. Session 1864), shows for each Registration District in London the annual average deaths from small-pox in children under five years of age for every 100,000 children living in each district under five years of age, during the ten years 1851–1861. It is certain that these deaths must have been nearly all preventable, for scarcely any children dying from small-pox at this early age could ever have been successfully vaccinated. The districts are arranged in the order of mortality from small-pox in these young and presumably unvaccinated children. The registration district of Kensington includes the unions of Paddington, Kensington, and Fulham, that of Stepney includes the unions of (*a*) Stepney and (*b*) Mile End Old Town.

Registration District.	Annual Average Deaths from Small-pox per 100,000 living under 5 Years of Age.	Registration District.	Annual Average Deaths from Small-pox per 100,000 living under 5 Years of Age.
St. Olave, Southwark	257	Stepney (*a* and *b*)	123
St. Luke	251	Newington	117
St. George, Southwark	232	St. Martin-in-Fields	113
Whitechapel	217	London City	112
St. Giles	216	Lambeth	111
East London	209	Pancras	106
Rotherhithe	207	Marylebone	97
Westminster	193	St. George-in-East	96
West London	187	Clerkenwell	93
Bethnal Green	184	St. James, Westminster	85
St. Saviour, Southwark	183	Kensington	76
Strand	176	Lewisham	67
Bermondsey	176	St. George, Hanover Square	64
Greenwich	138	Wandsworth	55
Shoreditch	136		
Poplar	134	Camberwell	44
Islington	131	Hackney	39
Chelsea	124	Hampstead	29
Holborn	123		

APPENDIX.

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1. In London, by Dr. Seaton and Dr. Buchanan.

vigilance as to vaccination is required in the poorer and low-lying districts with a very migratory population.

We have no data for calculating the number of cases of small-pox that occurred in London during the epidemic. The mortality in the practice of those public vaccinators from whom we obtained information, taken together with the mortality in the Small-pox Hospital, has led us to estimate the deaths at about one tenth of the cases. The mortality, in proportion to the recoveries, was usually larger in those districts when the epidemic had only prevailed for a short period. It was larger among persons transferred to the Small-pox Hospital or to the parochial infirmaries than among those retained in their own homes. Of course the tendency was to remove the severer cases in preference to the milder ones.

In vaccinated and unvaccinated,

It is a matter of considerable regret to us that no proper record has been kept of the cases that occurred among vaccinated and unvaccinated people respectively. We have not even numerical information upon this point in respect of the fatal cases. We were assured, however, quite universally, by the district medical officers with whom we conferred, that deaths in their practice occurred in the very large majority of cases among persons who had not been vaccinated, and it was remarked with almost equal constancy by those medical officers who had inquired into the point, that the victims of small-pox among the vaccinated were in the main those who had very imperfect cicatrices of vaccination. We heard of very few instances of fatal small-pox among vaccinated persons under the age of puberty, and we only heard of one case (and of this the particulars were imperfect) of death from small-pox in a person who had undergone successful re-vaccination after the age of fourteen. The death registers yielded no reliable information respecting the vaccination of fatal cases of small-pox, most practitioners omitting to state whether the operation had been performed or no, and scarcely any recording the evidence on which alleged vaccination was presumed to have been successful. It is, however, corroborative of the statements that were made to us respecting the absence of vaccination in fatal cases, that 47 per cent. of the whole deaths from small-pox in London occurred in children under five years of age. We know how infinitely rare death from small-pox is in children of this early age who have been successfully vaccinated; and, on the other hand, that children of the earliest ages die in larger numbers than older persons when they have not the protection of this operation.

Small-pox engendered by neglect, and

by simple postponement of vaccination.

There is another point of view from which the utmost importance attaches to this great fatality of small-pox in young children. In our first chapter we have shown how largely vaccination is postponed, and what great arrears of vaccination have to be hastily made up on the coming of an epidemic. It cannot be enough impressed on the public that their anxiety is then very likely to come too late. Speaking only of children born since the passing of the compulsory Vaccination Act, we have calculated with complete confidence in our results, that seven eighths of the children cut off by small-pox in the recent epidemic would have been saved if they had all been vaccinated at two months old. The law has justly undertaken to protect helpless children from this direct consequence of their parents' neglect, but it requires a strict administration of the law really to get rid of that great accumulation of unvaccinated children among whom small-pox finds its chief and earliest victims.

Different susceptibility of vaccinated and unvaccinated.

Leaving the consideration of fatal cases, we may recall (although it has reference to a longer period than the recent epidemic) the experience of our school inspection as to the relative degree in which the

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vaccinated and unvaccinated had suffered from small-pox to the extent of being marked by it. While less than 1 in 1,000 of the best vaccinated, and 19 in 1,000 of the worst vaccinated, were scarred by small-pox, those whose vaccination was doubtful bore scars of small-pox at the rate of 59 per 1,000, and of those who had no vaccine scar, at all no less than 360 per 1,000 were disfigured by small-pox.

In the recent epidemic we found that the vaccinated community had suffered more in some unions than in others. Very various statements were made by the medical officers of the unions respecting the proportion of cases occurring among the vaccinated. In many places vaccinated persons had exhibited the great numerical majority of the attacks; in other places the number of cases occurring in the vaccinated had not amounted to the number occurring in the unvaccinated of the district. But these diversities appeared all reducible to one general rule. Whenever small-pox had recently appeared it was stated by almost all medical men to have affected the unvaccinated mostly, or the unvaccinated and vaccinated to an equal numerical extent. Where we visited a union that had suffered for some months from the epidemic we were assured as constantly that the largest numbers of attacks had been among the vaccinated*, but it was almost invariably added, that at the commencement of the epidemic the unvaccinated were chiefly attacked.† This circumstance shows how direct and personal an interest the vaccinated community has in preventing the accumulation around them of an unvaccinated population that invites and fosters epidemic small-pox.

Earlier susceptibility of unvaccinated.

In 1860 one of the inspectors, who is now reporting, upon completing an inquiry into the epidemic of small-pox that was then abating in London, wrote as follows: "Now that the alarm of small-pox has passed away, it is certain that people will relapse into the old habits of indifference and neglect, and that, without constant vigilance, a re-accumulation of susceptible persons will take place, and go on till it shall attain the amount which will admit of another of those epidemic visitations from which London is never free for

Recurrence of epidemic small-pox.

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* It is hardly necessary to say that this arises simply from the overwhelming preponderance in numbers of the vaccinated over the un-vaccinated. The *proportionate* number of attacks was in every place enormously greater among the unvaccinated.

† Instances of this, reduced to figures, could be obtained in some instances. In St. Giles and Bloomsbury, where the medical officer keeps an excellent register of small-pox, the disease began to prevail in January 1863 and reached its highest point in March. In January the unvaccinated were three quarters of the whole number of cases; in February they were more than half; in March they were little more than a third of the whole; while in April they formed scarcely more than a quarter of the cases coming under treatment. In St. Pancras, in so far as the vaccination of the small-pox cases was recorded, three quarters were unvaccinated among those admitted in the workhouse wards the first month of their opening, while the general proportion of unvaccinated was only one in every six cases admitted.

It is noticeable that this rule of the unvaccinated being earliest attacked, which appeared to obtain so universally in London districts, was not confirmed by the experience of the Small-pox Hospital, where the proportion of vaccinated to unvaccinated remained pretty constant from the beginning to the end of the epidemic. The practice of sending severer cases only to hospital would, however, appear a reason why the experience of this hospital is not available on the point under consideration.

The circumstance of more unvaccinated persons being attacked at the beginning than at the end of a small-pox epidemic is of course partly accounted for by the larger numbers of unvaccinated that reside in a community at the outbreak of the disease. But this consideration by no means explains the vast degree to which the difference went at the commencement of the epidemic, *e.g.* in the parishes just cited.

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"more than two years together." In the middle of 1862 appeared the epidemic to which the present chapter refers. With no more thorough adoption of vaccination than has been hitherto observed the next epidemic of small-pox will be on us before the end of 1866.

When next epidemic due.

Action in view of the epidemic of 1863: By the Council.

In view of the rapid increase of small-pox in the first months of 1863, the Lords of the Council, in directing the present inquiry on March 28th, ordered the inspection to be commenced in those districts where small-pox appeared most prevalent, and they instructed the inspectors to advise the local authorities of the metropolis as to the most available means of arresting the epidemic. The course which their Lordships thought necessary to be generally taken on account of the epidemic were in April communicated to all the London Boards of Guardians through the Poor Law Board. Their Lordships recommended measures for the detection of unvaccinated children; that every possible facility should be given for vaccination, and that re-vaccination should be afforded to persons who properly required it; that proceedings should be taken against parents who neglected or refused to have their children vaccinated; and that temporary hospital accommodation should be provided by the unions for cases of small-pox which could not be received into the Small-pox Hospital.

The advice that was thus conveyed to the local authorities was of much use in causing them to exercise their functions with increased activity, and doubtless contributed much to check the spread of the epidemic.

By boards of guardians.

Measures were taken in almost all the unions of London to meet the epidemic of small-pox. All the unions but three issued some special placard, warning their parishioners as to the prevalence of the disease, and usually announcing the arrangements for public vaccination. Many unions added also a clause recommending re-vaccination. Two of the unions that did not issue small-pox placards increased the issue of their ordinary vaccination notices. Some districts, as St. Pancras, were very scantily and insufficiently placarded, while in others, as Shoreditch and St. Saviour's, the bills of warning were to be seen at the corners of every street.

The guardians of twelve unions had had a periodical report made to them upon the prevalence of small-pox, or had appointed a committee to watch the epidemic. One of these unions, Islington, had appointed a special medical inspector, to take from the Registrars lists of the children whose vaccination was not certified to them, to inquire into each of these cases, to examine all the schools, and to report on the general state of vaccination in the parish. An inspector, with similar functions, is habitually employed by the guardians of Paddington. Two parishes, Islington and Clerkenwell, appointed for the occasion extra public vaccinators.

Provision for small-pox cases.

With very few exceptions, it had been the custom of all the London unions in ordinary times to send such cases of small-pox as were recommended by their medical officers for removal from home to the Small-pox Hospital at Highgate. On the prevalence of the disease as an epidemic, however, the hospital was rapidly filled, and the unions had to make special arrangements for the reception of their small-pox cases. Two of them, Islington and Clerkenwell, by a triple payment for each case, got admission for all the cases they sent, even at the height of the epidemic. The guardians of thirty unions received patients suffering from small-pox into the workhouse or into some parochial building, or (in two unions) into houses specially hired for

the purpose. It was usually with some reluctance that the guardians took cases of small-pox into the workhouse itself.*

The degree to which small-pox patients were isolated from other inmates, on admission to the workhouse or parochial infirmary, was most various. In St. Giles's Workhouse it is the custom in ordinary times as well as under the pressure of an epidemic to treat small-pox cases in the same wards with other persons. In Paddington the same mixture of small-pox patients with others was practised at the height of the epidemic there. In other workhouses the wards for small pox were distinct, but adjacent to rooms occupied by healthy persons or by persons suffering from other diseases. Usually, however, the isolation was fairly complete, some detached building or distant ward being used for small-pox cases. In ten workhouses into which small-pox patients were received a few cases of the disease had appeared among other inmates. The largest degree to which this extension was observed was in the Wandsworth Workhouse, where for 14 cases admitted from outside 18 cases originated in the house, and one of them proved fatal.†

Action by sanitary authorities.

The Vestries and District Boards of London, to whom the Metropolis Local Management Act of 1855 gives the charge of the sanitary condition of the metropolis, received, in most instances, special reports from their medical officers of health upon the progress of small-pox, and in several districts caused placards to be issued and handbills to be circulated in the neighbourhoods where small-pox prevailed. Many medical officers of health inspected the schools in their districts, and urged vaccination and re-vaccination upon all whom they found to stand in need of these operations. In several districts inquiry was made at the houses and throughout the streets where small-pox had shown itself, and the vaccination of persons peculiarly exposed to small-pox was thus ensured.

The Association of Medical Officers of Health issued in April 1863 a circular to the boards of guardians of the metropolis, urging the removal of the poor affected by small-pox from their crowded houses, and recommending the construction of temporary buildings, when required, for the reception of such cases. In this circular they also urged the issue of placards to notify the vaccination arrangements, and the employment of inspectors during the period of the epidemic to ascertain cases of neglect, with power to take proceedings in all cases of wilful refusal to comply with the requirements of the Vaccination Acts.

By public vaccination.

The public vaccinators as a body used to the utmost their personal influence to increase vaccination in their districts. Many of them, whose practice at other times was to vaccinate at their stations only, had for the occasion carried vaccination from house to house, and in infected districts from room to room. Some public vaccinators had

* All the unions, but two or three, were provided with special vehicles for the conveyance of small-pox cases to the hospital or workhouse, but this did not always prevent the re-employment of street cabs for the removal even of parochial cases. St. Pancras and Islington are believed to be the only parishes that kept one carriage exclusively for small-pox, the other unions employing the same vehicle for the conveyance of other infectious disorders, and in some cases using the same vehicle for lunatics or for healthy persons.

† In St. Giles's Workhouse, where no isolation was attempted, only two inmates had contracted small-pox up to the time this district was visited. The younger inmates were here very thoroughly re-vaccinated. In Paddington Workhouse only one instance of extension of the disease had occurred. Here the small-pox cases were mixed with persons whose age constituted some safeguard against the disease, and children were carefully kept out of the way.

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inspected the schools, and had vaccinated as far as possible all those who were found unprotected.

Under all these influences that have been enumerated, the primary vaccinations by the public vaccinators, so far as they could be separated from the re-vaccinations, rose from their yearly average of 46,000 in 1861-2 to about 74,000 in 1863, the public vaccinations of children under one year of age, being 30 per cent. more numerous than usual, while the primary vaccinations over one year of age were three and a half times as many as in non-epidemic years.

Re-vaccination.

Re-vaccination was practised by public vaccinators in all the unions of London. Although cases of re-vaccination were not properly distinguished from primary vaccination in the books of most contractors, we are able to estimate the number of persons who were vaccinated for the second time in 1863 at the public expense at nearly 60,000.

We found the utmost ignorance to prevail among the public as to the conditions under which this operation should be performed. Experience appears to have demonstrated that while thorough primary vaccination in infancy affords a very great protection against bad small-pox all through the life of the individual, that secondary vaccination at puberty is a valuable additional protection against an attack of the disease in the adult period of life, and that therefore even those whose first vaccination is good should be at puberty submitted to re-vaccination with as much regularity as infants to the primary operation. In the case of those whose first vaccination is unsatisfactory, and who are, as we have seen, susceptible of small-pox to a much larger degree than the well vaccinated, it is of especial importance to afford the additional protection of re-vaccination, and in such instances the instructions permit of re-vaccination being performed at an earlier age than twelve years.

We found, however, that the custom was universal of deferring re-vaccination altogether until periods of epidemic small-pox, and that several injurious results had hence arisen. In the first place, those badly protected by their primary vaccination had suffered in large numbers from small-pox before the warning came to them that they should be re-vaccinated. We were informed of many instances where persons much exposed to small-pox had received re-vaccination while small-pox was actually incubating in their bodies. In the second place, the notion that re-vaccination is only indicated according to the presence of actual small-pox had led to the custom of repeating re-vaccination at short intervals, whenever small-pox was about. And, thirdly, an ignorance of the proper age at which vaccination should be repeated had caused a multitude of unnecessary re-vaccinations to be performed for young children who are perfectly well protected by their primary vaccination.

Many public vaccinators had not attempted to guide the public as to the proper conditions for re-vaccination, but read their contracts to the effect that they were bound to vaccinate every parishioner who applied to them, irrespective of their own opinion of the necessity of the operation. It is right to say that the authorities of the Poor Law Board held the same opinion as to the duty of vaccinators under the law and under their contracts.

Of the vaccinators who had exercised any selection of the persons on whom to perform re-vaccination, 35 only were guided in any strictness by the instruction that dissuades from re-vaccination, even in epidemic times, of efficiently vaccinated children under the age of 12 years. Eighteen vaccinators, while taking the quality of scar as indicating the need of re-vaccination, had not accepted the provision of the instruction as to age. Sixty-two vaccinators, caring nothing

for the scars of the primary vaccination, had adopted an exclusive standard of age, usually recommending re-vaccination in every child over seven years of age. And 86 vaccinators operated for a second time without regard either to age or to efficiency of the primary vaccination.

In 27 of the unions that we visited notes were made of the relation between the primary and the secondary vaccination of all the re-vaccinated children who were met with in the schools.* The children in the workhouses and industrial establishments were often largely re-vaccinated, the operation being usually the more indicated on account of the admission of small-pox into the workhouses. Excluding these children, and those in schools for children of mixed ages, we found that in infant schools 2·6 per cent. of the whole number had been re-vaccinated, and in elder children 7·8 per cent. had been re-vaccinated at the time of our visit. The re-vaccination for the elder children was in almost all instances done before the age of 12 years.

Re-vaccination seen in schools.

The relation between the scars of primary vaccination and the re-vaccination of those children is shown in the two groups of children respectively in the following tables. It will be observed that while some attention was paid to the scars of children in both groups, and while the elder children were more copiously re-vaccinated than the infants (under the notion of the seven years' standard), that a great number of re-vaccinations were performed which were not called for, and which, so far as they were public vaccinations, were not sanctioned by the instructions under which contractors act.

RE-VACCINATED CHILDREN.

Children with Primary Vaccine Marks.	In Infant Schools. Age usually 2–7 years.			In Elder Schools. Age usually 7–13 years.		
	Good.	Tolerable.	Bad.	Good.	Tolerable.	Bad.
With four or more	23 out of 1606 or 1·4 per cent.	6 out of 663 or 0·9 per cent.	6 out of 426 or 1·4 per cent.	255 out of 3357 or 6·6 per cent.	77 out of 1342 or 5·7 per cent.	45 out of 720 or 6·2 per cent.
With three marks	36 out of 1836 or 2·0 per cent.	48 out of 608 or 2·6 per cent.	10 out of 525 or 1·9 per cent.	257 out of 3753 or 6·8 per cent.	83 out of 1279 or 6·4 per cent.	57 out of 805 or 7·0 per cent.
With two marks	50 out of 1632 or 3·1 per cent.	23 out of 702 or 3·3 per cent.	21 out of 495 or 4·2 per cent.	295 out of 3591 or 8·2 per cent.	106 out of 1373 or 7·7 per cent.	81 out of 882 or 9·2 per cent.
With one mark	35 out of 898 or 3·9 per cent.	23 out of 442 or 5·2 per cent.	18 out of 286 or 6·3 per cent.	205 out of 2009 or 9·8 per cent.	82 out of 789 or 10·3 per cent.	79 out of 525 or 15·0 per cent.

In the case of an operation about the utility of which public opinion is yet but imperfectly formed it is of the greatest consequence to avoid all sham results, and to perform the operation in the most conclusive way. But we found that in fact the habit of entering cases as successful that were never inspected prevailed with secondary equally with primary vaccinations, and there were many school children who showed no evidence that lymph had been inserted into their arms who called themselves re-vaccinated, and whose cases had even (in some instances examined) been recorded as successful re-vaccinations. As to the efficient performance of the operation, moreover, we observed the widest difference in the practice of different vaccinators. While one practitioner operating carefully (by abrasion) had failed in 4 per cent. only of his cases to get the local effects of inserting the lymph, and

* The experience of the remaining twelve unions is not cited, as all the re-vaccinated were not observed. But the facts derived from them agreed with what follows from the experience of the 27 unions.

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had in 21 per cent. of his cases obtained vesicles the cicatrices of which were scarcely distinguishable from those of primary vaccination, another practitioner, operating on a similar group of cases, had failed in nearly a third of his cases to get any local results whatever, and in 5 per cent. only of his re-vaccinations had obtained a vesicle or scar at all approaching in character to that of primary vaccination. We had evidence that great numbers of persons had received a re-vaccination of no efficiency whatever, and we cannot doubt that the value of the operation may be seriously prejudiced in the eyes of the profession and the public by the loose way in which it has been carried out in practice.

Chapter V.—ABSTRACT AND SUGGESTIONS.

Abstract.

We now proceed to sum up the general results of our inquiry, and to submit such suggestions as it is within the scope of our instructions to make.

We trace the frequency of epidemic small-pox and its great fatality in London, 1, to the great extent to which vaccination is still neglected and postponed; 2, to the very imperfect and insufficient way in which it is frequently performed.

As to amount of vaccination.

We found the main causes of neglect and postponement to be these; 1, the apathy and indifference of many parents; 2, want of confidence in the proffered vaccination on the part of others, and dread of ill consequences succeeding the operation from the use of improper lymph; 3, want of opportunities for obtaining vaccination, especially such vaccination as enabled parents always to see the children from whom lymph was taken, and to have reasonable assurance of the good performance and success of the operation. Our inquiries convinced us that the number of persons who have repugnance to vaccination altogether, who object to it at all times and however well performed, is relatively excessively small, and that comparatively few children remain unvaccinated from that cause.

The remedies, therefore, for deficient amount of vaccination, appear to us to be obvious; 1, the establishment of arrangements which shall afford parents all the opportunities requisite for good vaccination, and shall ensure confidence in the correct and satisfactory performance of the operation; 2, supervision of the fulfilment of duties on the part of apathetic and indifferent parents.

As to quality of vaccination.

We found the main causes of imperfect vaccination to be these; 1, the imperfect performance of the operation by many vaccinators, in contravention of rules which for nearly 50 years have been recognised and observed by the National Vaccine Establishment*, and (so far as regards any public vaccinations performed since January 1860) in contravention of the instructions which vaccinators under contract are bound to observe; 2, the extent to which operations have failed, or to which imperfect results only have followed, in consequence of the employment of preserved lymph, or of inferior (because non-selected) lymph, in the performance of vaccination. From the arrangements for public vaccination which we have described it was

* The National Vaccine Board, in their report for 1820, state that the principle of the practice they adopt and inculcate is "to affect the constitution of each individual very "completely with the vaccine disease;" and, adverting to their directions to their own operators to make four punctures, they add "from extensive experience and numerous reports the Board have become most earnestly desirous that more rather than "fewer vesicles should be produced." The statistics of the Small-pox Hospital show that great sacrifice of life, and necessarily, therefore, no small disrepute to vaccination, have resulted from the frequent disregard of this principle.

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inevitable that the operation should be performed in a large proportion of cases under one or other of these conditions.

The remedies for this defective quality of vaccination, which it falls within the province of public authorities to apply, appear to us to be, 1, to secure for children publicly vaccinated in London the uniform performance of arm vaccination with selected lymph; 2, to extend to the ordinary public vaccinating stations the supervision provided for in the organization of the National Vaccine Establishment.

We found, in brief, that the present arrangements entirely fail to fulfil the plain intentions of the Legislature:—

Principle of suggestions.

"First. That thoroughly good vaccination, provided at the public "expense under proper arrangements, should everywhere and gratis "be within the reach of persons who may choose to avail themselves "of it:

"Second—but of course subject to the above—that it should be obli- "gatory on parents to have their children vaccinated, health permitting, "within three calendar months from birth."*

And we proceed to show how, in our opinion, these objects may best be secured.

What vaccinating arrangements in a large town ought to be.

But, before entering into detail, we think it desirable to state in general terms what "proper arrangements" for the public performance of vaccination in a thickly peopled town appear to us to imply. They imply that, at each place appointed for public vaccination, parents should at stated times be able invariably to obtain vaccination for their children direct from the arms of other children under conditions which afford ample opportunities for selecting the best kind of lymph; they imply that vaccination should be uniformly performed by the appointed vaccinator, or by a legally appointed deputy, and that the efficient performance of vaccination and efficient working of the station should be guaranteed (as at the stations of the National Vaccine Establishment) by proper inspection; and they imply that at each place there should be proper accommodation for the applicants, and that the respective stations should be so placed with regard to each other that no parent should have to take her child an unreasonable distance for vaccination.

For proper arm vaccination a number of cases is indispensable;

which should not be less than 10 on an average, on each vaccinating day,

The first of these requisites—the maintenance of continuous vaccination with proper selection of lymph—cannot be obtained with any degree of certainty with less than 500 yearly applicants at a station, the vaccination being restricted to one week-day; and we referred at page 8 to their Lordships' recommendation to local authorities of large town districts not to subdivide their vaccination beyond the point which will secure *at the least* for each station this number of applicants. But we have experience which shows that stations work much more satisfactorily, with fewer chances of interruption in the lymph-supply, and, necessarily, with much greater opportunities of selection, when the annual number of cases vaccinated at the weekly attendance extends to a thousand† or upwards. Such stations are in operation in

* Fifth Report of the Medical Officer of the Privy Council, page 4.

† For even with this number of cases, or with a number larger than this, there are sometimes occasions when the applicants on the vaccinating day fall down to six or eight, or are even fewer. And it must always be recollected that the lymph-supply of a station and its opportunities of selection depend on the number of children *who are brought back at the time given for inspection*, and that *this is* usually short of the numbers who have been vaccinated the week before. One of the inspectors now reporting is familiar with nearly all the vaccinating stations in England which are of any magnitude, and can testify to the overwhelming advantages of those which have the larger number of applicants.

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and should, whenever possible, be at least 20.

Advantages of such stations.

Manchester and Birmingham. At the St. George's station, Manchester, the average annual vaccinations exceed 1,400, and at the principal vaccinating station in Birmingham they exceed 1,300, the vaccinations at each station being performed on the Mondays only. At these stations the best arm-vaccination is invariably attainable, vaccination is performed with the utmost success, and supplies of first-rate lymph are constantly kept up.† The advantages of these stations are greatly appreciated by the public, and children are not unfrequently brought to them from considerable distances, as they are often brought long distances in London to the chief stations of the National Vaccine Establishment. Their benefit, moreover, is not limited to the actual applicants at the stations. It extends to children who are vaccinated by private practitioners in the respective towns, who can always rely on the stations for affording first-rate lymph direct from the arm. We propose that all the stations in the most thickly peopled parts of London should be of this class. In the less densely peopled parts we would retain the minimum of 500 yearly applicants. In the suburbs we would approach that minimum as nearly as circumstances might admit.

Accommodation required.

The accommodation required for a vaccinating station is the use of a commodious room, or preferably of two rooms, in a well frequented locality for two or three hours once a week, with provision for their more frequent use at periods of small-pox epidemics. The use of the rooms, with attendance, for this limited period of time being all that is necessary, the rent of these stations is generally very trifling. To the use of vaccinators' surgeries as stations there are the following objections,—(1) they would not, except for small suburban stations, afford the requisite accommodation, (2) they would frequently not be in the precise situation where the station was most desirable, and (3) their use gives to public vaccination too much of the private relation of doctor and patient. A board or plate notifying the arrangements should be conspicuously affixed to every station.

Distance of stations from one another.

Public vaccination should, where permitted by other considerations, be procurable within half a mile of every house. Stations of the magnitude we propose might be so placed that scarcely any part of central London would be so distant as this from a station, while* on the average each station would be within a quarter of a mile of every person's door. In most parts of London stations are at present much nearer to each other than is herein implied; but this apparently convenient result has been obtained, as we have shown, only by the disregard of every consideration of efficiency in the stations. In the less densely populated districts it might be requisite to have the stations at a somewhat greater distance than this from some houses. We do not ourselves conceive that there is any hardship in a mother having to take her child even a mile for vaccination, provided that when she gets to her journey's end she is sure to find the vaccinator and children from whose arms the lymph can be taken. What appears to us a very considerable hardship is that she should have to go to a station, even though near at hand, again and again before she can get her child vaccinated at all, or that she should have to submit her

* At the station of the National Vaccine Establishment at Surrey Chapel in 1863, there were only 3 unsuccessful operations, out of 1479 inspected primary vaccinations. At Birmingham station in 1863 there was only one unsuccessful operation out of 1,205 vaccinations; and taking the average of the vaccinations performed for a considerable period at the larger provincial stations in connexion with the National Vaccine Establishment (which include the Birmingham and Manchester stations cited in the text) we have ascertained that the unsuccessful operations are not above 1 in 170.

child to vaccination in a way little conducive to success, and of which she does not approve. We found repeatedly, in fact, that parents did go considerable distances, and passed half a dozen other stations to arrive at one which was well frequented.*

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The vaccination of London should, in our opinion, be provided for as a whole, without reference to parochial or union boundaries. So strongly have we felt this to be essential to any system of efficient public vaccination, that we have declined to use the authority given to us to communicate to the various boards of guardians proposals for improving their separate vaccination arrangements.

Arrangements for public vaccination should be made for London as a whole.

Seven of the London unions—five of which were quite centrally situated—had in 1861-2 a number of infantile vaccinations short of the minimum required for the proper maintenance of arm-to-arm vaccination. If each of these unions had had but a single station it could not have been supplied from the union itself with sufficient cases for its successful working. And only a few of the very largest unions would be able to maintain first-class stations.

Under the present system, the convenience of the public as to proximity of station is constantly disregarded, through the necessity of observing the boundaries that separate one London union from another. Very frequently persons have to go away from the nearest vaccinating station in order to get vaccinated; and there are even localities where (through the artificial lines of the union boundaries) persons may have to pass the vaccinating station of some other union on their road to their own district station. A glance at the accompanying map will show how the restriction of public vaccination by the boundary of each union gives impediments to vaccination throughout London, and how considerable the inconvenience thus artificially created may become in certain cases. We propose that every resident in London should have access to the vaccinating station that was most convenient to him.

It sometimes happens that a parent has, or professes, a dislike to a particular operator, or finds the hours of attendance at a particular station inconvenient, and the necessity of providing for the public wants in these respects has been made an excuse for the injurious multiplication of vaccinators and attendances in a union. The plan of giving a parent free access to all stations appears to us to obviate this difficulty in an unobjectionable way.

While persons resident in the suburbs would of course be provided with the best station that their numbers permitted, it is our ex-

* "Our arrangements must be carefully made," says Jenner, writing to a gentleman whose children he had undertaken to vacciuate, "as the children *must be met here* "by proper subjects for transferring the lymph; for on the accuracy of this part "of the process much depends." To us it appears nothing short of a scandal that in the thickly peopled parts of London there should be such a thing as public vaccination with preserved lymph. We desire to call attention to the following excellent observations by the medical officer of health of the city of London, in which we entirely concur:—"At present it is more than doubtful whether the processes "for the preservation of lymph are not all imperfect; and seeing how much more "successful is the operation when performed with lymph taken at once from the "ripe vesicle upon the arm, and not from dried points or capillary tubes, it is an im-"portant question whether in every large town, where it is so easy to keep up a con-"stant succession of cases, this should not be the invariable method of performing "the operation. To this end the number of vaccinators should be reduced as far as "possible, and it should be the task of one or two officers to perform this duty for a "large district. The advantages of such an arrangement would not only be in the "perfect conservation of the lymph, but also in the proper performance of the opera-"tion; for although it seems to be but a very simple affair, it really requires a great "amount of skill and experience to ensure its success."

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For which 50; or 60 stations will be amply sufficient.

perience that many will willingly take trouble to come into London for the advantage of a well frequented station. These persons, again, would be able to apply at any of the metropolitan stations that suited them best.

We find that of such stations as we propose,—frequented in the central parts of London by not less than a thousand applicants yearly, in the less dense parts by at least five hundred, accessible by every resident in London, and under a quarter of a mile, on the average, from every person's door,—the metropolis would maintain about fifty or sixty, if the remoter suburbs be excluded from consideration. The arrangement wanted for the central parts would not of course apply to detached villages like Hampstead, Dulwich, or Eltham. But including all the thickly populated suburbs, we estimate that from 30 to 40 stations on the north of the Thames, and from 15 to 20 stations on the south of the Thames, would be the right numbers to give the best vaccination with the greatest facilities to the persons who required it.*

A single authority required.

The establishment and supervision of the stations we propose can only be effected by combined action of all the unions of London, or by some single body acting for the whole metropolis. And in the absence of any machinery for combining the action of the unions of London, or of a municipality to whom the function of regulating the public vaccination of London could properly be transferred, we are constrained to recommend either that this duty be devolved on a committee of the Metropolitan Board of Works or on a special board to be constituted for the purpose.

Duties of this Authority.

This committee or board would exercise all the functions which are now exercised by 39 separate authorities, independent of minor local influences, and with complete dissociation of public vaccination from parish medical relief. To the exercise of these functions it would bring special attention, and, in a short time, special experience. It should also be armed, in our opinion, with certain additional powers for the employment of inspectors.

Its duties we would define as follows:

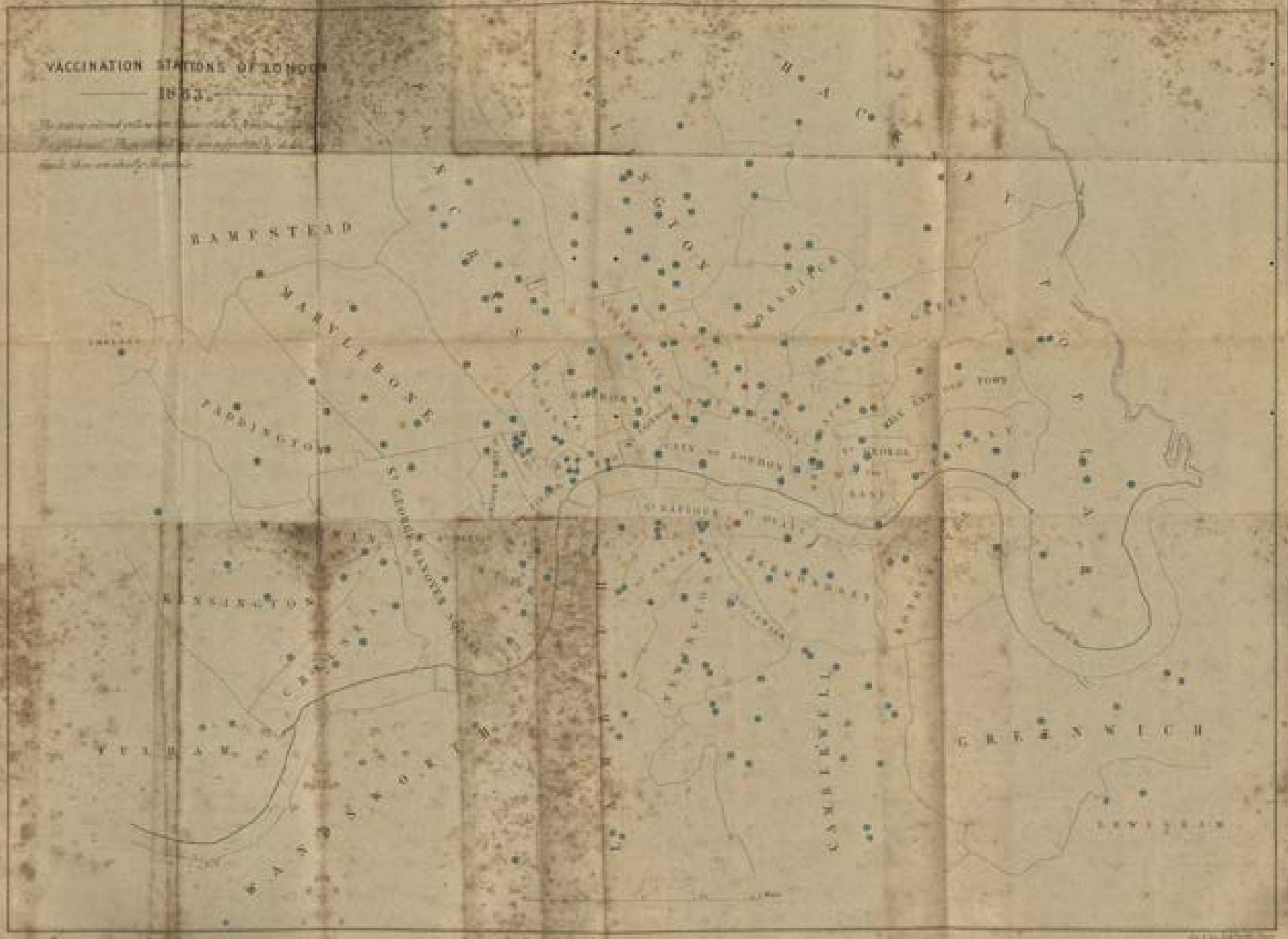
As to stations.

1. *To fix the vaccinating stations.* In this they would be unfettered by a variety of extraneous considerations, which now seem to fetter most boards of guardians, and the interests of the public at large in good vaccination, readily accessible, would be exclusively consulted.

As to appointment of vaccinators.

2. *To appoint the public vaccinators.* The number of the appointments being restricted, and their advantages being consequently greater, they would be sought no doubt by professional men who had paid special attention to vaccination. At the outset the best of the existing vaccinators might be selected. Nothing in the course of our inquiries has struck us more forcibly than the great difference of results of different operators working under apparently the same conditions. This difference was quite irrespective of general professional attainments, and depended altogether on special knowledge and special practical skill; for however trifling as a surgical operation vaccination may be, there is nothing more certain than this, that careful observation, practical experience, and painstaking accuracy are indispensable for securing its proper results. We do not hesitate for a moment to express our strong conviction that the vaccination of London would be best done by a few

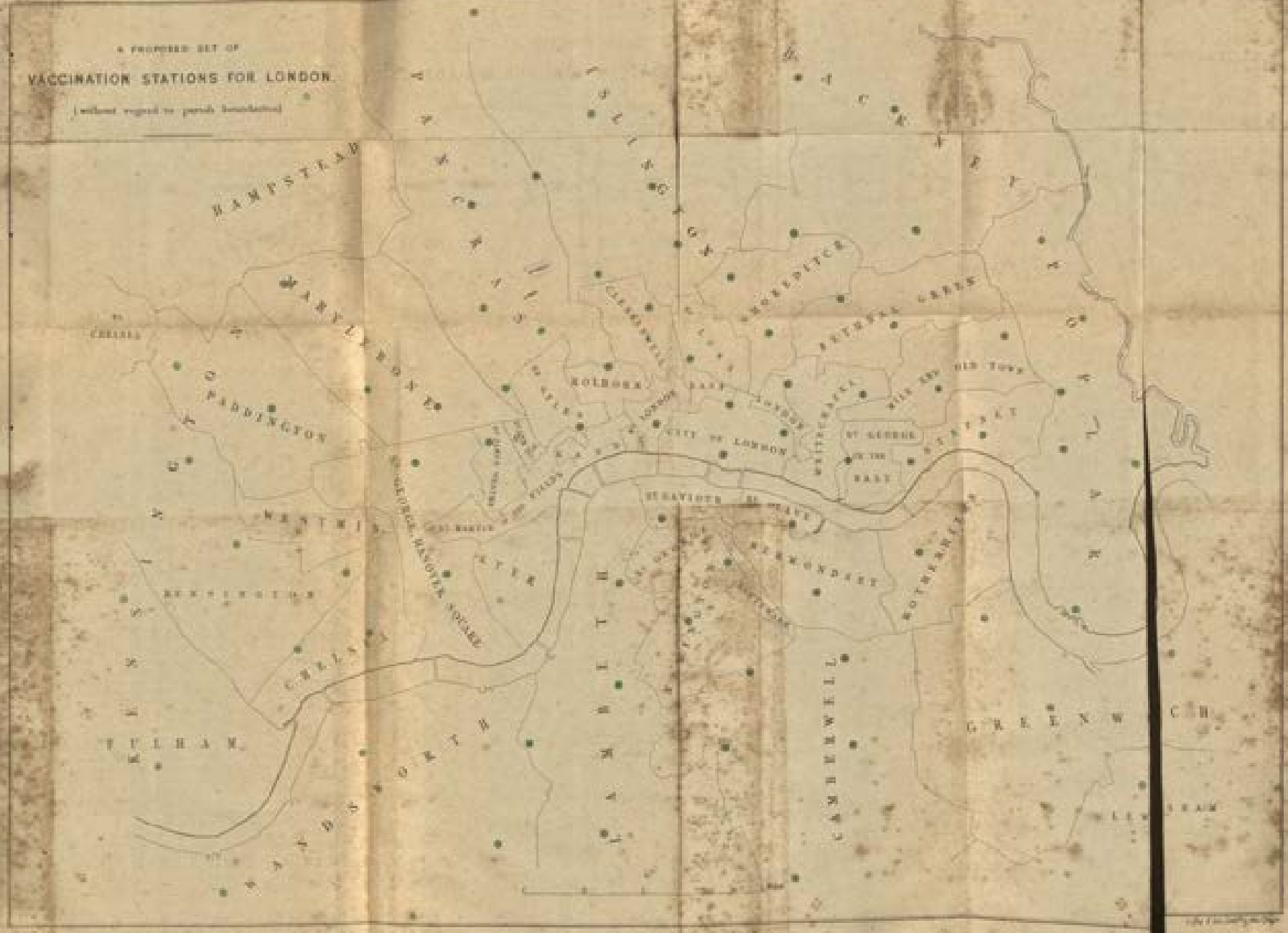
* Taking a map, and having regard to circumstances of locality, to density of population, the special requirements of poor districts, and so on, we have worked out with some care an actual set of vaccinating stations. The very practical character of our recommendations has come in this way to impress us strongly by contrast with the singularly ill arranged set of stations at present existing.


VACCINATION STATIONS OF 1870-1871
1883.
HAMPSTEAD
MARYLEBONE
PADDINGTON
KENSINGTON
FULHAM
CHELSEA
GREENWICH

A PROPOSED SET OF

VACCINATION STATIONS FOR LONDON.

(without regard to parish boundaries)



thoroughly trained vaccinators, who devoted themselves exclusively to the work. As the vaccinating days at different stations would differ, four or five first-rate stations could easily be undertaken by the same operator.

3. *To supervise the working of the stations as to the regular attendance of the vaccinator, and the performance of his various contract duties.*

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4. *To supervise the due fulfilment of duties by registrars in regard to vaccination, and to direct the announcements to be made in each sub-district.*

5. *To issue the public notifications respecting vaccination,* and to advertise, when needed, information concerning local outbreaks of small-pox.

As to supervision of stations.

6. *To examine, through their clerk, at short regular intervals, the register of each vaccinating station, and to forward to each parish once a quarter a list of all the vaccinations chargeable to it.* This is on the supposition that public vaccination is to remain, as heretofore, a special charge on the parish of the person vaccinated. But, considering the great personal interest that every one has in the vaccination of the entire community, and the express intention of the Legislature that the great advantage of public stational vaccination should be open to all, we think that no valid objection exists to the simple plan of rating, for the purposes of public vaccination, every union on the basis of its population. A fund would then be at the disposal of the London Vaccination Committee, or Board, to meet all charges connected with public vaccination.

As to registrars.
As to public notices.
As to accounts.

7. *To supervise the fulfilment of their duties by parents,* to warn those who were negligent, and to see that the compulsory provisions of the law were adopted when needful. We here repeat our conviction, the grounds of which we have stated in our first chapter, that efficient supervision of this kind is the only way of reducing to a minimum the dangers, the alarms, and the enormous expenses of constantly recurring small-pox epidemics. And we would here insist, again, on the absolute necessity of ensuring the systematic return of children for inspection, in order that the results of vaccination may be properly ascertained, and the lymph-supply of the respective stations properly maintained.* We propose that the Vaccination Board should employ inspectors, each of whom should be attached to certain fixed registration sub-districts. The business of an inspector would be to see that all children whose births are registered were certified to the registrar as having been duly vaccinated within the period after birth required by law; to give warning to parents in cases in which this had been neglected; to make local inquiries regarding the vaccination of unregistered children, and of immigrants, such as are now made in a few localities in London by sanitary inspectors, and in Paddington by a special inspector; and to see that the children vaccinated at the public stations were duly taken back to the vaccinator for inspection. It would also be his duty, under such rules as the board should lay down, to take proceedings against parents, when other means had failed. We think it would be advantageous that each inspector should have sufficient work assigned to him to occupy the whole of his time, or at any rate that he should hold no appointment connected with the local boards of guardians. In common

As to supervision of parents' duties.

* There can be no sympathy for selfish parents who, having got from vaccination all the benefits they can for their own children, prevent, as far as in them lies, the extension of these benefits to others. One of the first means required for promoting proper public vaccination is to put into force the provisions of the Vaccination Acts relative to the return of children for inspection.

with many persons with whom we have conferred, we regard the efficiency of this officer as greatly affected by the degree to which he would be independent of local influences and prepossessions.

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8. *On the occurrence of local outbreaks of small-pox and at periods of epidemic prevalence of that disease to issue such warnings, to give such additional facilities for vaccination, and to make such provisions for re-vaccination as might be needed by the circumstances of the case.* Early information of outbreaks would always be afforded by the medical officers of health of the respective districts.

As to epidemics of small-pox.

There are at present in London nine vaccinating stations, maintained from a special parliamentary grant, for purposes of national lymph supply. The London Vaccination Board would find it of great advantage to direct their attention in the first instance to these stations—some of them first-class stations; and to adopt the best and most convenient of them, as part of the plan for the general public vaccination of London. Whenever such stations as we have proposed for the central parts of London shall be established, it would in our opinion be unnecessary and most undesirable that a separate system of stations for national lymph-supply should be kept up. The chief metropolitan stations would furnish abundant supplies of first-rate lymph for national purposes, and payment for such lymph out of the parliamentary grant would form part of the income of the London Vaccination Board.

Stations of the National Vaccine Establishment.

Supervision of stations as to efficient performance of vaccination.

The supervision of the stations with regard to the efficient performance of vaccination would, it appears to us, be satisfactorily provided for by the systematic exercise of the powers conferred on the Lords of the Council by the Public Health Act to direct inquiries as to the observance of the regulations and directions issued by them for the more efficient performance of public vaccination.

Legislative sanction required for some of these changes.

The plan we have thus felt it our duty to submit would require legislative sanction for the transferring to a single authority the functions now exercised by separate boards of guardians; for making public vaccination a metropolitan instead of a parochial charge; and for enabling the vaccination authority to employ local vaccination inspectors. But our recommendations would be incomplete if we did not point out changes in the present vaccination laws which appear to us to be also very urgently needed for making more perfect the security of London against the dangers of recurring small-pox.

Other amendments of law needed.

As to registration of vaccination.

The chief basis of operations for the proposed vaccination inspectors is the vaccination register kept by the registrars of births and deaths. This register is now extremely and necessarily imperfect; but it could be made of the greatest practical utility by a very simple change, which would provide for the reistration of vaccination in the books of the sub-district in which the birth is recorded, as is done in the Vaccination Act for Scotland of last session; and it would be rendered still more perfect if the registration of births were made compulsory in England, as it is in Scotland and Ireland.

As to delivery of notice.

The peculiarly migratory character of the London population gives particular importance to the next suggestion which we have to make. From one cause or another it often happens that evidence cannot be obtained of the delivery of notice by a registrar within seven days of a child's birth. We would propose that, as in the Act for Scotland, proof of the delivery of this notice should not be required.

As to schools.

We deem it also of considerable moment that children entering at national, British, and parochial schools of London should produce satisfactory evidence of their being protected against small-pox by

vaccination, unless they shall have already had small-pox. We would make this an indispensable condition of admission. The evidence should consist of the certificate of the surgeon who performed the vaccination, or of a registered medical practitioner that he had examined the cicatrices and was satisfied of the protection of the child.

Lastly, it is requisite that the law should define the conditions under which re-vaccination may be performed at the public expense. In the uncertainty which at present exists, several boards have declared that they will not in future pay for re-vaccination; and the public may hence be deprived of a very important security.

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As to re-vaccination.

SUPPLEMENT.

Supplement.

SUPPLEMENT I.

SUCCESSFUL PUBLIC VACCINATIONS and BIRTHS. In non-epidemic years 1860–1 and 1861–2; and in 1862–3, the period of epidemic small-pox.

UNION AND POPULATION, 1861.	Mean of Years 1860–61 and 1861–62.			Year 1862–63.		
	Vaccinations.		Registered Births.	Vaccinations.		Registered Births.
	Under 1 Year.	Over 1 Year.		Under 1 Year.	Over 1 Year.	
Paddington (75,784)	717	116	2,250	971	1,807	2,379
Kensington (70,108)	598	76	2,196	1,001	1,701	2,420
Fulham (40,058)	531	50	1,322	816	473	1,436
Chelsea (63,439)	968	157	2,125	1,265	3,603	2,031
St. George, Hanover Sq. (87,771)	957	58	2,414	1,006	1,553	2,227
Westminster (68,213)	1,431	106	2,216	1,830	4,400	2,216
St. Martin (22,689)	329	22	617	411	509	629
St. James, Westminster (35,326)	512	60	977	783	241	929
Marylebone (161,680)	2,314	271	5,081	2,515	6,156	5,122
Hampstead (19,106)	108	205	489	100	376	559
Pancras (198,788)	2,661	307	6,778	3,357	6,902	7,269
Islington (155,341)	2,053	255	5,537	3,148	4,728	6,024
Hackney (83,295)	1,322	250	2,653	1,091	2,175	3,083
St. Giles (54,076)	441	56	1,768	504	719	1,864
Strand (42,898)	595	60	1,314	633	1,535	1,307
Holborn (44,290)	656	103	1,340	951	1,572	1,363
Clerkenwell (65,681)	917	53	2,310	1,171	1,109	2,381
St. Luke (57,073)	915	43	2,567	969	634	2,616
East London (40,687)	560	76	1,373	693	925	1,284
West London (26,997)	356	43	778	339	349	747
London, City (45,555)	335	40	1,065	325	391	970
Shoreditch (129,364)	2,130	154	5,180	3,243	3,840	5,384
Bethnal Green (105,101)	1,848	883	4,302	2,417	6,012	4,451
Whitechapel (78,970)	1,802	200	2,812	1,912	3,561	2,812
St. George East (48,891)	750	124	1,891	1,170	939	1,924
Stepney (56,572)	825	145	1,825	1,184	1,829	1,906
Mile End Old Town (73,064)	1,083	221	2,809	1,324	895	2,984
Poplar (79,196)	1,443	236	3,248	2,834	5,185	3,490
St. Saviour, Southwark (36,170)	795	105	1,366	1,021	1,483	1,128
St. Olave (19,056)	221	33	611	231	146	585
Bermondsey (58,355)	899	119	2,476	1,189	865	2,549
St. George, Southwark (55,510)	781	43	2,027	922	928	2,120
Newington (82,220)	995	97	2,950	1,150	1,914	3,093
Lambeth (162,044)	2,219	595	5,341	2,932	8,790	6,390
Wandsworth (70,463)	669	168	2,223	1,256	1,043	2,555
Camberwell (71,488)	969	220	2,431	1,573	4,948	2,622
Rotherhithe (24,502)	360	50	827	389	935	827
Greenwich (127,670)	2,175	321	4,600	2,671	1,092	4,571
Lewisham (65,757)	937	59	2,417	1,062	519	2,528
Total Metropolis	40,087	5,980	96,105	52,068	81,792	100,774

This table is derived from the return annually made by each district to the Poor Law Board. There are in these returns frequent inaccuracies (see note to page 104), and there are sometimes omissions which we have filled up from the best data we had.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London, by Dr. Seaton and Dr. Buchanan.

Supplement II.

SUPPLEMENT II.

SUMMARY RESULT of SCHOOL INSPECTION in each of the LONDON UNIONS.

(All children with doubtful scars, as well as all children just vaccinated for the first time, are excluded from the following analyses, but are included in the total of children examined. It happened that in Mile End Old Town and St. George East, the examination did not include enough children to give a very trustworthy representation of the vaccination in these large unions.)

I.-PADDINGTON.

Children examined, 1,605.

1,514 with vaccine marks, 1 of whom scarred by small-pox.
73 without vaccine marks, 24 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	231	95	59
Three	118	45	37
Two	150	69	42
One	89	38	27

II. KENSINGTON.

Children examined, 1,849.

1,729 with vaccine marks, 2 of whom scarred by small-pox.
105 without vaccine marks, 24 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	188	83	69
Three	129	70	61
Two	111	73	56
One	76	52	32

III. FULHAM.

Children examined, 1,587.

1,483 with vaccine marks, none of whom scarred by small-pox.
88 without vaccine marks, 13 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	127	86	33
Three	148	87	43
Two	152	105	52
One	91	54	22

IV. CHELSEA.

Children examined, 2,312.

2,184 with vaccine marks, 2 of whom scarred by small-pox.
113 without vaccine marks, 37 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	211	113	47
Three	135	74	45
Two	140	79	35
One	64	45	12

V. ST. GEORGE, HANOVER SQUARE.

Children examined, 1,196.

1,144 with vaccine marks, 4 of whom scarred by small-pox.
46 without vaccine marks, 14 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	228	92	47
Three	155	58	43
Two	134	54	40
One	81	40	28

VI. WESTMINSTER.

Children examined, 1,390.

1,298 with vaccine marks, 2 of whom scarred by small-pox.
70 without vaccine marks, 43 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	297	106	47
Three	135	52	39
Two	110	50	30
One	68	37	28

VII. ST. MARTIN.

Children examined, 407.

390 with vaccine marks, none of whom scarred by small-pox.
14 without vaccine marks, 6 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	161	77	33
Three	172	74	76
Two	139	67	72
One	77	46	36

VIII. ST. JAMES, WESTMINSTER.

Children examined, 821.

775 with vaccine marks, 3 of whom scarred by small-pox.
31 without vaccine marks, 12 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	160	48	21
Three	156	54	34
Two	170	73	47
One	127	58	54

IX. MARYLEBONE.

Children examined, 2,121.

1,983 with vaccine marks, 6 of whom scarred by small-pox.
93 without vaccine marks, 34 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	235	67	27
Three	166	62	29
Two	154	58	35
One	88	51	28

X. HAMPSTEAD.

Children examined, 691.

650 with vaccine marks, 1 of whom scarred by small-pox.
31 without vaccine marks, 5 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	157	70	42
Three	182	71	55
Two	141	76	34
One	103	38	31

XI. PANCRAS.

Children examined, 2,568.

2,445 with vaccine marks, 7 of whom scarred by small-pox.
94 without vaccine marks, 31 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	261	49	17
Three	225	45	26
Two	175	36	22
One	94	35	15

XII. ISLINGTON.

Children examined, 1,660.

1,575 with vaccine marks, 5 of whom scarred by small-pox.
62 without vaccine marks, 21 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	189	73	25
Three	193	65	20
Two	162	65	31
One	112	40	25

XIII. HACKNEY.

Children examined, 1,165.

1,075 with vaccine marks, 1 of whom scarred by small-pox.
76 without vaccine marks, 11 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	159	26	21
Three	230	52	32
Two	207	61	35
One	122	33	22

XIV. ST. GILES.

Children examined, 1,986.

1,863 with vaccine marks, 1 of whom scarred by small-pox.
97 without vaccine marks, 34 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.*

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	225	59	36
Three	202	50	30
Two	162	50	28
One	105	38	20

* The marks of 110 children were not sufficiently classified, and are not used in the tabular statement.

XV. STRAND.

Children examined, 939.

885 with vaccine marks, 1 of whom scarred by small-pox.
40 without vaccine marks, 20 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	237	77	28
Three	165	55	26
Two	150	72	37
One	71	42	38

XVI. HOLBORN.

Children examined, 878.

828 with vaccine marks, 1 of whom scarred by small-pox.
33 without vaccine marks, 11 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	122	74	80
Three	133	82	71
Two	104	85	67
One	69	59	54

XVII. CLERKENWELL.

Children examined, 855.

790 with vaccine marks, 4 of whom scarred by small-pox.
52 without vaccine marks, 17 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	148	57	33
Three	225	76	55
Two	120	61	58
One	80	42	45

XVIII. ST. LUKE.

Children examined, 1,032.

945 with vaccine marks, 3 of whom scarred by small-pox.
70 without vaccine marks, 25 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	134	51	36
Three	136	56	72
Two	156	81	75
One	102	55	46

XIX. EAST LONDON.

Children examined, 524.

473 with vaccine marks, 3 of whom scarred by small-pox.
44 without vaccine marks, 19 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	108	55	36
Three	120	74	83
Two	147	91	93
One	88	55	50

XX. WEST LONDON.

Children examined, 691.

632 with vaccine marks, 4 of whom scarred by small-pox.
54 without vaccine marks, 13 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	160	66	33
Three	161	76	30
Two	153	63	67
One	106	49	36

XXI. LONDON CITY.

Children examined, 530.

488 with vaccine marks, 2 of whom scarred by small-pox.
35 without vaccine marks, 9 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	158	55	37
Three	164	86	55
Two	138	84	57
One	90	41	35

XXII. SHOREDITCH.

Children examined, 2,090.

1,954 with vaccine marks, 3 of whom scarred by small-pox.
89 without vaccine marks, 36 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	173	53	27
Three	198	53	29
Two	187	63	53
One	102	37	25

XXIII. BETHNAL GREEN.

Children examined, 1,926.

1,804 with vaccine marks, 3 of whom scarred by small-pox.
82 without vaccine marks, 36 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	174	42	27
Three	216	50	28
Two	211	54	49
One	95	23	31

XXIV. WHITECHAPEL.

Children examined, 1,017.

911 with vaccine marks, 2 of whom scarred by small-pox.
85 without vaccine marks, 36 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	204	43	29
Three	215	45	36
Two	201	53	26
One	100	30	18

XXV. ST. GEORGE EAST.

Children examined, 261.

250 with vaccine marks, none of whom scarred by small-pox.
10 without vaccine marks, 4 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	204	52	16
Three	280	52	40
Two	144	44	32
One	92	28	16

XXVI. STEPNEY.

Children examined, 961.

898 with vaccine marks, 2 of whom scarred by small-pox.
42 without vaccine marks, 22 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	191	43	14
Three	198	49	24
Two	239	58	39
One	88	36	21

XXVII. MILE END OLD TOWN.

Children examined, 445.

416 with vaccine marks, 4 of whom scarred by small-pox.
25 without vaccine marks, 10 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	212	46	19
Three	216	53	13
Two	207	53	31
One	116	24	10

XXVIII. POPLAR.

Children examined, 2,207.

2,060 with vaccine marks, 4 of whom scarred by small-pox.
122 without vaccine marks, 44 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	172	32	21
Three	273	48	27
Two	198	44	27
One	107	31	20

XXIX. ST. SAVIOUR SOUTHWARK.

Children examined, 528.

495 with vaccine marks, 3 of whom scarred by small-pox.
27 without vaccine marks, 15 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	141	63	38
Three	127	45	43
Two	208	71	42
One	123	55	44

XXX. ST. OLAVE.

Children examined, 311.

289 with vaccine marks, 1 of whom scarred by small pox.
20 without vaccine marks, 13 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	76	52	55
Three	163	62	45
Two	266	107	52
One	56	35	31

XXXI. BERMONDSEY.

Children examined, 718.

673 with vaccine marks, 1 of whom scarred by small-pox.
36 without vaccine marks, 21 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	153	85	38
Three	210	76	30
Two	186	65	27
One	67	35	28

XXXII. ST. GEORGE SOUTHWARK.

Children examined, 806.

738 with vaccine marks, 2 of whom scarred by small-pox.
63 without vaccine marks, 29 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	110	68	39
Three	165	84	34
Two	180	73	47
One	95	56	49

XXXIII. NEWINGTON.

Children examined, 1,656.

1,539 with vaccine marks, 3 of whom scarred by small-pox.
94 without vaccine marks, 35 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	231	64	41
Three	196	49	38
Two	168	42	32
One	89	26	24

XXXIV. LAMBETH.

Children examined, 1,764.

1,620 with vaccine marks, none of whom scarred by small-pox.
113 without vaccine marks, 50 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	145	69	49
Three	170	61	33
Two	168	50	48
One	108	54	45

XXXV. WANDSWORTH.

Children examined, 1,728.

1,629 with vaccine marks, 1 of whom scarred by small-pox.
86 without vaccine marks, 9 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	102	47	36
Three	153	75	50
Two	224	90	61
One	96	43	23

XXXVI. CAMBERWELL.

Children examined, 1,542.

1,453 with vaccine marks, none of whom scarred by small-pox.
66 without vaccine marks, 17 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	83	56	30
Three	180	108	77
Two	139	82	65
One	87	54	39

XXXVII. ROTHERHITHE.

Children examined, 827.

766 with vaccine marks, none of whom scarred by small-pox.
41 without vaccine marks, 22 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	90	40	18
Three	163	58	20
Two	311	82	38
One	103	51	26

XXXVIII. GREENWICH.

Children examined, 1,842.

1,674 with vaccine marks, 5 of whom scarred by small-pox.
142 without vaccine marks, 32 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	141	59	35
Three	162	76	45
Two	188	85	48
One	94	40	27

XXXIX. LEWISHAM.

Children examined, 1,626.

1,496 with vaccine marks, none of whom scarred by small-pox.
108 without vaccine marks, 16 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	169	95	58
Three	135	77	66
Two	119	70	56
One	81	45	29

Nos. 1–4. *Local Inquiries as to Vaccination.*

1. In London. by Dr. Seaton and Dr. Buchanan.

Supplement II. —*continued.*

XL. INDUSTRIAL SCHOOLS, into which pauper children from several Unions are received.*

Children examined, 3,774.

3,454 with vaccine marks, 15 of whom scarred by small-pox.
243 without vaccine marks, 121 of whom scarred by small-pox.

Quality of marks per 1,000 vaccinated.

Vaccine Marks.	Good.	Tolerable.	Bad.
Four or more	174	50	34
Three	142	62	45
Two	175	67	67
One	85	38	41

* Where the children of a Workhouse or Industrial Establishment were wholly from one Union, they are included in the statement for that Union.
By an accident, 154 children observed in the workhouses of six unions have not been included in the statistics of the Appendix. Their number however is too small to have any effect upon the per-centage results, and they have been included in the statements of the report itself.

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

2. DR. SEATON'S SUMMARY of the RESULTS of his INQUIRY in certain UNIONS in YORKSHIRE, HEREFORDSHIRE, and WALES.

The Unions inspected during 1863 were (besides the metropolitan Unions separately reported on) 44, viz., 26 in Yorkshire, comprising all the unions situated in the North and East Ridings; one in Herefordshire, completing the inspection of that county; and 17 in Wales, completing the inspection of the principality.

In all these unions and parishes, except the parishes or townships in the Bainbridge Incorporation in the North Riding, and four adjacent townships which are not included in any union or incorporation, one or more medical practitioners were appointed to vaccinate at the public cost.

The following table shows the unions inspected, and, with regard to each, 1st, the number of vaccinating districts into which it was divided; 2nd, the number of public vaccinators appointed; and, 3d, the proportion which, on the returns annually made to the Poor Law Board, the infantile public vaccinations bore to the registered births for the years ending Michaelmas 1860, 1861, and 1862 respectively :—

TABLE I.

Union.	Number of Vaccinating Districts in each Union.	Number of Contractors for Vaccination in each Union.	Infantile Public Vaccinations in Proportion to every 100 registered Births.		
			Year ending Michaelmas 1860.	Year ending Michaelmas 1861.	Year ending Michaelmas 1862.
		8	21	14	24
York	10	5	49	40	40
Pocklington	5	4	44	42	42
Howden	4	6	42	24	37
Beverley	6	8	51	38	43
Sculcoates	8	18	69	71	75
Hull	2				

TABLE I.—*continued.*

Union.	Number of Vaccinating Districts in each Union.	Number of Contractors for Vaccination in each Union.	Infantile Public Vaccinations in Proportion to every 100 registered Births. Year ending Michaelmas 1860.	Year ending Michaelmas 1861.	Year ending Michaelmas 1862.
Patrington	5	4	46	57	46
Skirlaugh	5	5	54	43	71
Driffield	8	8	41	40	40
Bridlington	4	4	41	33	32
Scarborough	5	5	26	33	26
Malton	13	8	41	36	42
Easingwold	4	4	43	44	39
Thirsk	4	7	60	37	39
Helmsley	2	2	54	51	42
Kirkby Moorside	1	1	55	50	43
Pickering	3	3	25	25	30
Whitby	5	5	43	45	25
Guisbrough	5	5	50	47	47
Stokesley	3	3	59	42	45
Northallerton	4	3	29	10	19
Bedale	4	4	54	27	51
Leyburn	6	5	45	45	47
Bainbridge*	—	—	—	—	—
Reeth	2	2	†	†	†
Richmond	6	5	45	45	47
Ross	4	4	†	†	†
Hay	2	2	38	52	45
Builth	2	2	28	35	35
Brecon	3	3	31	47	22
Crickhowell	4	4	57	76	70
Abergavenny	2	2	67	66	65
Monmouth	6	6	36	42	40
Chepstow	5	5	68	73	63
Newport	5	5	39	38	36
Pontypool	3	3	32	50	46
Bedwellty	5	5	53	42	48
Merthyr Tydfil	11	11	53	55	56
Pont-y-pridd	6	6	‡	‡	‡
Cardiff	8	8	52	58	49
Cowbridge and Bridgend	4	4	52	74	84
Neath	6	6	64	62	63
Swansea	3	3	70	68	66
Gower	2	2	84	48	62
Total	205	213	—	—	—

It sometimes happened that the same contractor had a district in two, or even in three, adjacent unions; so that the number of vaccinators contracted with fell short of the number of contracts by 16. The 213 contracts were held by 197 individuals.

The objects of inquiry were the same, and the methods of investigation pursued were the same, as in the inspections of previous years. The summary results I shall proceed to state under the heads of (1) the

* The parishes and townships in this incorporation had not made the arrangements required by law for public vaccination.

† The returns made to the Poor Law Board were quite inaccurate.

‡ This union was only constituted at the end of 1862.

APPENDIX. Nos. 1–4. *Local Inquiries as to Vaccination.*

amount of infantile vaccination in the unions inspected, (2) the quality of the vaccination, (3) the arrangements for the performance of public vaccination and their influence on the amount and quality of the local vaccination, and (4) the prevalence of small-pox, especially of recent small-pox, in the various unions.

I. AMOUNT OF INFANTILE VACCINATION.

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

A careful examination of the registers of the public vaccinators in the unions inspected, and personal inquiry into the state of vaccination of the children in attendance at various national, parochial, and other charitable schools, and of those residing in workhouses, proved for the unions collectively the existence of considerable postponement and neglect of vaccination. (1.) Of the primary vaccinations which in three years had been performed by the public vaccinators, it was found that an exceedingly small proportion had been effected within the precise age directed by the law, and that though most of the children had been vaccinated between the ages of three and twelve months, yet in nearly one-fifth of the whole number of cases the vaccination had been postponed beyond the period of infancy. But (2) it was proved that large numbers of children of age to be in attendance at schools remained yet unvaccinated. Of 23,245 children examined in the schools and workhouses of the 44 unions, 2,788, or 12 per cent., were without marks of vaccination. Of these children, 6,296 were in infant schools or in infant divisions of mixed schools, and of them 891, or upwards of 14 per cent., were found on examination to be without vaccination marks. It is strikingly illustrative of the extreme risk which attends this postponement of vaccination, that of the 2,788 children who were without vaccine marks, 662, or nearly a fourth, were already scarred by small-pox. The proportion of children who, on the days of inspection of the respective schools, were without any protection against small-pox, was, in the schools and workhouses generally, 9 per cent., and in the infant schools 12 per cent.

General postponement and neglect of vaccination.

No union was thoroughly vaccinated.

This general insufficiency of infantile vaccination, which was proved for the unions collectively, was found to exist, though in very varying degrees, in each of them individually. There was no union in which I had not evidence, as regarded some portion or another of it, of undue postponement and neglect of vaccination; but in some, as in the Leyburn Union in Yorkshire, or the Chepstow Union in Monmouthshire, the arrears were comparatively trifling and insignificant, while in others, as York, Scarborough, Ross, or Cardiff, they assumed really formidable proportions. So much, however, did the influence which the local administrators of vaccination,—the public vaccinators and registrars of the respective districts,—exercised on the amount of vaccination performed exceed that of the local authority*, that it was a matter of mere accident to find the various districts of any union either all well vaccinated or the contrary. Districts which were numerically well vaccinated were repeatedly found side by side with districts which were numerically very badly vaccinated in the same union.

But in some districts infantile vaccination was well carried out;

For an account of the separate vaccinating districts, I had not in any "Register of Successful Vaccinations" the same materials for exact numerical statement which I had the preceding year for the Mold district of the Holywell Union. It was certain, however, that in none of the districts included in this year's inspections did the vaccination in literal fulfilment of the law (within three months of birth) approximate to the amount performed in that model district. Tried, therefore, by this standard, every district may be said to have been deficient. Very com-

* Simply because the local authority was supine and neglected its duty. When it was active, as in Chepstow Union, the result was very visible.

monly, however, in districts in which the systematic performance of infantile vaccination was a matter of great care, the vaccination was performed between three and four months of age; and assuming this to be a practical fulfilment of the obligations of the law as regarded towns and districts in which vaccination could be maintained continuously, and that in others, in which it could only be properly carried on periodically, even yet a little more latitude should be allowed, there were 29 out of the 205 inspected districts, the vaccination of which appeared to me entirely satisfactory. These comprised both rural and mining populations; they did not comprehend any large town, but one or two minor towns, as Richmond and Masham in Yorkshire, and Bridgend in Glamorganshire, are included. And these results may, in each instance, be ascribed to the diligence and system of the contractors, aided or not, as the case might be, by the registrars or by the local authority.*

in others less completely;

But if the children residing in other districts were found less completely vaccinated, it must not necessarily be inferred that great pains might not have been taken with regard to vaccination, or that the importance of infantile vaccination was not greatly valued. There were between 40 and 50 districts in which there were evidences of much careful attention to infantile vaccination. In some of these, indeed, the results were in parts of the districts (those parts in which the contractor's personal influence was paramount) as satisfactory as in any of the districts comprised in the first class; in others the deficiencies extended through the district, but still could not be represented as very formidable; and there were a few town and mining populations in which the pains bestowed had succeeded in reaching the native population generally, the arrears consisting mostly of immigrants from other places.

and in most very insufficiently and irregularly.

But in considerably more than half the inspected districts, the infantile vaccination of the native population was very insufficient in amount, and in most of these vaccination was very irregularly carried on. There were many districts in which I found there had been no performance of public vaccination for periods varying from one to three years. Such were, in Yorkshire, two districts of the York Union; the Pickhill district of Thirsk; the Sherburn district of Scarborough; the Cranswick and Wetwang districts of Driffield; the middle and part of the west district of Patrington; the Holme district of Howden; the Northallerton and Appleton districts of Northallerton; both districts of Reeth; and, in Wales, the Devynnock district of Brecon. So also, as regarded parts of the districts, the Pocklington district of Pocklington; the Pickering and Thornton districts of Pickering; the Oswaldkirk district of Helmsley; and the third district of Ross. In some districts of the class under consideration there were large accumulations of unvaccinated children, as shown by the high proportion found unvaccinated in the schools. Thus, 22 per cent. of the children seen in the schools of York were without mark of vaccination, 23 per cent. of those in Scarborough, 26 per cent. of those in Ross, 41 per cent. of those in Hawes. Of the youngest children who were examined, as in infant schools and the infant classes of mixed schools, the proportions of unvaccinated ranged from

* The Blaenafon district of Abergavenny is a large mining district in which infantile vaccination has been thoroughly well maintained. A proof of this was given in the great epidemic of small-pox of 1857-8, when, though the disease prevailed in this, as in the surrounding districts, the mortality was almost exclusively confined to unvaccinated *adults*, of whose want of protection the contractor was ignorant until he was called upon to attend them in their small-pox attack; there were but two deaths of *illegally* unvaccinated *children*.

20 to 47 per cent. in the following districts, the figures in brackets representing the per centage in each, omitting decimals: Newport in Newport Union, (20), Bridlington Quay in Bridlington Union (22), Cardiff in Cardiff Union (22), Glyn Taff in Pont-y-pridd Union (23), Scarborough in Scarborough Union (27), Thornton Dale in Pickering Union (29), Pocklington in Pocklington Union (30), Driffield in Driffield Union (31), Pontypool in Pontypool Union (33), Ross in Ross Union (47).

No large or middle-sized towns properly protected against small-pox.

These illustrations of much neglected districts comprise several of the larger towns included in the year's inspections,—York, Scarborough, Newport, Cardiff; and I had, to a less degree, evidence of insufficient amount of vaccination in Hull, Beverley, Whitby, Merthyr, Tredegar, Swansea. There was not, in fact, one large town, or town of moderate size, which I found in anything like a state of efficient protection against small-pox,—a consideration of the utmost importance, because it is in towns and thickly-peopled districts that fatal small-pox epidemics mostly occur. This was not probably in any one of them *wholly* chargeable to local neglect of vaccination, though in all but Swansea there was evidence that the local neglect was considerable, and in some, as York, that it was extreme and scandalous; but something was due in each place to unvaccinated immigrants from other neglected districts. In the movement of population daily taking place, neglect in one district is constantly operating to the danger and damage of another. This was well illustrated in Swansea, which is the (numerically) best vaccinated town I have inspected. Of the registered births of the town, 75 per cent. are annually vaccinated by the public vaccinator, 87 per cent. of all his vaccinations being performed on children under four months of age. In those infant schools which are most frequented by the native population, I found (on examining 452 children) 14 children, or 3 per cent. of those examined, unprotected against small-pox, and these were not all natives; but in two schools, which are chiefly attended by Irish immigrants, the proportion unprotected was 12 out of 157, or nearly 8 per cent. Small-pox was prevailing at Swansea at the time of my inspection: from the former schools scarcely any children were absent with it; from the latter several, and there were several more in the schools who had recently had it, not one of whom had been vaccinated.

Vaccination in workhouses.

The following table exhibits the state of vaccination of children above the age by which vaccination ought by law to have been performed in workhouses:—

TABLE II.

Showing the results of the examination of children in workhouses.

Unions.	Number of Children examined.	Number without Marks of Vaccination.	Number with doubtful Marks of Vaccination.	Number unvaccinated, or doubtfully vaccinated, who had Marks of Small-pox.	Number of Children unprotected on Day of Inspection.
York	109	43	1	11	33
Pocklington	23	4	—	—	4
Howden	40	6	—	—	6
Beverley	10	1	—	—	1
Sculcoates	117	12	2	11	3
Hull	131	15	1	13	3
Patrington	21	1	—	—	1

Table II.—*continued.*

Unions.	Number of Children examined.	Number without Marks of Vaccination.	Number with doubtful Marks of Vaccination.	Number unvaccinated, or doubtfully vaccinated, who had Marks of Small-pox.	Number of Children unprotected on Day of Inspection.
Skirlaugh	20	1	—	1	—
Driffield	56	9	2	1	10
Bridlington	13	—	—	—	—
Scarborough	12	3	—	1	2
Malton	51	4	—	1	3
Easingwold	19	6	—	—	6
Thirsk	25	4	—	3	1
Helmsley	15	—	—	—	—
Kirby Moorside	8	2	—	—	2
Pickering	15	—	—	—	—
Whitby	45	6	—	1	5
Guisborough	30	3	—	2	1
Stokesley	9	—	—	—	—
Northallerton	21	3	—	—	3
Bedale	—	—	—	—	—
Leyburn	11	—	—	—	—
Reeth	10	—	—	—	—
Richmond	9	—	—	—	—
Ross	42	6	1	2	5
Hay	18	3	—	—	3
Brecon	43	12	1	—	13
Crickhowell	20	2	—	1	1
Monmouth	39	5	—	2	3
Chepstow	46	4	—	2	2
Pontypool	39	8	—	1	7
Abergavenny	31	4	1	—	5
Newport	142	36	2	19	19
Bedwellty	52	17	—	5	12
Merthyr Tydfil	116	42	—	18	26
Cardiff	153	33	2	15	20
Swansea	50	10	1	3	8
Neath	19	3	2	2	3
Bridgend	46	—	—	—	—

In some of the cases in which the children were unprotected, this was with the perfect knowledge of the vaccinator, and for good reasons, as on account of skin disease or other hindering cause. But such was by no means generally the case, and the neglect was often quite without excuse. The workhouse of York is an extreme instance, in which nearly a third of the children were unprotected, though small-pox had been very fatally epidemic for some months in the city. In the Newport workhouse some of the unprotected children had been born in the house, and were, when inspected, from one to four years old. In some of the workhouses, the vaccination was most carefully looked after, and it will be seen in the table that there were several in which there was no unprotected child.

Causes of defective amount of vaccination: Absence of supervision.

Causes of insufficiency.—Upon these I need not enlarge, as I found them to be exactly the same as in districts reported on in former years, viz., the absence of systematic supervision and bad arrangements. Cases in which parents objected to vaccination altogether, and said that at all risks they would resist it, were occasionally mentioned, but the strength of resistance had in none of these cases been tested by pro-

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and defective arrangements.

ceedings. Where such cases were mentioned, they were spoken of as exceptional, and it was in very few districts that they were mentioned at all. The general feeling of the people was described everywhere as one of willingness and even of anxiety for vaccination; and those who neglected it were said to do so chiefly from apathy, indifference, or procrastination, except under immediate fear of small-pox. In the mining districts the very great change in the disposition of the people, and the almost entire absence now of objections which had once been seriously obstructive, were frequently brought to my notice. "If there "was only some one who, when the time was up, would just go round "and remind them, I believe without any threatening at all we should "have them all done," were the words of the Registrar of Merthyr. And statements to the same effect were repeatedly made to me. But the carelessness of parents, in the absence of supervision, was a subject of constant complaint; and the difficulties which arose therefrom in the conduct of vaccination were frequently very great. In many districts in which the arrangements left no excuse for neglect, the neglect was yet considerable.

On the other hand, it was very certain that the want of proper opportunities for vaccination, and especially for vaccination direct from the arm, had very much indeed to do with the insufficiency of vaccination in most of the districts in which it was defective, and it was probably the most influential cause in all in which it was seriously defective. It was an old story to hear of children taken to the vaccinator at announced times and places without finding him, or finding that he had no lymph wherewith to vaccinate. Among the children whom I have had to record as unvaccinated were not a few who had had vaccination attempted, but on whom the vaccination had failed from the employment of dry lymph. In some districts there were no definite arrangements for vaccination at all. "The people are very willing to be vaccinated," said a registrar of one of the Yorkshire unions, "but they "seem bewildered about it. They see by the paper they are to get "vaccinated, but how, it is all blank, and they seem to suppose from "this, that some time or another some one will come and do them. "Numbers of them have asked me where they were to take their "children to get them vaccinated. I spoke to the doctor, and asked "him to make some appointments, but he said it was ridiculous to "suppose with his large practice that he could fix any times that could "be kept to; but he'd do them some time or another." And there are numbers of districts which have now no better provision for public vaccination than this,—that some time or another, when it suits the doctor's convenience, he will do such children as he knows of. Of course others also may have it then if they chance to hear that vaccination is going on, and if not they must wait and get it as they can.

In so far as any of the inspected districts were well vaccinated, they were so, (1) because there was regular and systematic attendance of the vaccinators, and (2) because the vaccinators or registrars, or both of them, going beyond their contract or assigned duties, made it their business to *look after* the vaccination, and to see that the people gave proper attendance.

II. QUALITY OF VACCINATION.

Quality of vaccination.

To ascertain the quality of the vaccination which had been current in the inspected unions, I examined the cicatrices on the arms of 20,337 vaccinated children, with the following general results:—

TABLE III.

Showing the number and quality of vaccine marks in 20,337 vaccinated children.

Vaccine Marks.*	Good.	Tolerable.	Bad.	Total.
Four or more	1,940	533	231	2,704
Three	3,215	966	427	4,608
Two	5,591	1,639	860	8,090
One	2,945	1,146	844	4,935
Total	13,691	4,284	2,362	20,337

TABLE IV.

Showing the number of children in each class, out of every 1,000 children examined.

Vaccine Marks.	Good.	Tolerable.	Bad.	Total.
Four or more	95	26·2	11·2	132·4
Three	158	47·5	21	226·5
Two	275	81	42·3	398·3
One	145	56·3	41·5	242·8
Total	673	211	116	1,000

Distinguishing the Yorkshire from the Welsh unions, the numbers in each class were—

V. In Yorkshire.

Yorkshire and Wales compared in this respect.

Vaccine Marks.	Good.	Tolerable.	Bad.	Total.
Four or more	1,101	260	109	1,470
Three	1,543	418	175	2,136
Two	3,089	818	363	4,270
One	1,485	448	320	2,253
Total	7,218	1,944	967	10,129

* In this classification the area of the cicatrices was always taken into consideration, and single marks, which, resulting from compound vesicles, occupied more than average space, were estimated according to the space they covered. This correction, which has always been maintained throughout my inspections, was especially necessary as regarded a great many districts in Yorkshire, in which operators in the habit of scarifying over one or two surfaces only produced yet some of the fullest and most complete results of vaccination.

VI. In Wales (including the Union of Ross).

Vaccine Marks.	Good.	Tolerable.	Bad.	Total.
Four or more	839	273	122	1,234
Three	1,672	548	252	[a] 2,472
Two	2,502	821	497	3,820
One	[a] 1,460	698	524	2,682
Total	6,473	2,340	1,395	10,208

These comparative tables are very interesting. They show a marked superiority in the vaccination of the North and East Ridings over the vaccination of Wales, both as to quality of marks and amount of marking. But they exhibit for both of these divisions of the kingdom results which show that the vaccinated population were by no means protected as they ought to have been against small-pox. Not one-tenth part, indeed, of the vaccinated children had that all but complete protection which four proper vaccine scars have been found to give. About a fourth had the degree of security which is implied by three or more good marks. But a full fourth of the whole,—less in Yorkshire, and more in Wales,—depended for their protection either on marks which were imperfect in their character, or on one or two merely tolerable marks.

Large amount of bad vaccination.

The condition of children in this imperfect state of protection did not appear to me to be regarded generally with the serious attention which it deserves. The prevalent notion seemed to be that it was a misfortune for the children, no doubt, but one for which no one was to be held responsible; a result which could not be helped; that the children must get re-vaccinated, and all would be right. There is, indeed, the remedy of re-vaccination, so far as that may go,* when the imperfection is found out; but how many parents, whose children are insufficiently or imperfectly vaccinated, are aware of the imperfection? How many, for instance, of the parents of the 5,000 children to whose very imperfect protection I am now specially referring, supposed that their children had not received from vaccination all the protection it was capable of bestowing? How many were likely, except under the possible influence of some panic from small-pox, to have their children re-vaccinated? And why should they be put to the trouble of re-vaccination, when the vaccination ought to have been properly and completely done at first? For nothing could be more erroneous than the notion that the causes of imperfect vaccination were not in the main perfectly avoidable.

Causes of insufficient amount of marking.

1. *Defective number of marks or amount of marking* was seen in some districts associated with defective quality of the scars, and in others in which the quality was all that could be desired. It depended on one or both of two causes. Either (1) the vaccinators had not endeavoured to produce sufficient local effect, or (2) they had failed to secure the full results they aimed at. The latter was especially the case in districts in which preserved lymph was much used. Partial failure

* Mr. Marson's abundant experience has proved that even this cannot always be relied on to remedy the defects of original bad vaccination. For, in persons badly vaccinated, he tells us, the vaccination will often "never afterwards take effect "properly, and yet the individual may take small-pox severely."

was in these districts very common,* even in the hands of good vaccinators.

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The quality of the marks may be said to have depended all but absolutely on the skill and care of the vaccinators,—skill and care in the selection of lymph, in the mode of applying it, and in examination of the health and especially of the state of skin of the subjects submitted for vaccination.† There were districts in which imperfect marks were quite exceptional, and marks which were classed as tolerable were comparatively very few; there were others in which the number of tolerably and badly marked children nearly came up to or exceeded the number of children with good marks. To what could this difference be due, but to the respective vaccinators? For the children among whom it was observed were of the same class in life, of similar ages, and living under the same conditions as to town and country. In towns and places in which the work of different vaccinators was seen side by side, it presented often most remarkable contrasts. Thus, in the great town of Hull, alongside of vaccination as perfect as vaccination could be, was seen (and in no inconsiderable amount) vaccination inconceivably worthless, but which, nevertheless, had no doubt been paid for at the same rate out of the public purse. In the table below I exhibit for the sake of illustration the difference between some well and some ill-vaccinated districts, so far as figures can show it. It is impossible, however, to represent in figures the entire difference. In the districts, for example, selected as well vaccinated, the marks classified as good were very generally, and in some, almost uniformly, typical specimens; while in the districts selected as ill vaccinated, there were a large number of marks which had the genuine characters of the vaccine scar sufficiently developed to require they should be classed as good, though they might be far from being presentable as models of vaccination.

Causes of bad quality of marks.

Good and bad districts compared.

TABLE VII.

Showing the quality of vaccine scars in 12 well-vaccinated, and 12 badly-vaccinated districts.

Well-vaccinated Districts. Vaccine Marks.				Badly-vaccinated Districts. Vaccine Marks.			
District.	Good.	Tolerable.	Bad.	District.	Good.	Tolerable.	Bad.
A. -	70	5	—	a. -	55	30	15
B. -	207	47	8	b. -	156	92	94
C. -	30	2	—	c. -	17	16	18
D. -	110	22	5	d. -	132	77	69
E. -	170	27	15	e. -	142	75	40
F. -	110	6	—	f. -	132	52	55
G. -	109	7	4	g. -	97	45	22
H. -	48	9	2	h. -	46	25	22
I. -	65	15	1	i. -	60	49	33
K. -	74	8	3	k. -	90	40	17
L. -	67	5	1	l. -	89	43	27
M. -	66	18	1	m. -	9	8	13
	1,126	171	40		1,026	552	428

* See foot note * at p. 19.

† Whether from this cause, or from some imperfection in the lymph which had been in use, there was in one large town inspected a very extraordinary number of children with smooth shining or glazed cicatrices, quite worthless for protection.

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The contrast would have been more striking still if it had been possible to exhibit exclusively the work of individual vaccinators. Of the children seen in each of the compared districts, some had not been vaccinated by the contractor. In district A (that of Mr. Bird, of Tollerton), very nearly every child had been vaccinated by him; but of the five whose marks were classed as only tolerable, two at least came from other districts. In district F (that of Mr. Raines, of Roos), in which nine-tenths of the vaccination was that of the contractor, I ascertained of every child having only tolerable marks that the vaccination had not been done by him. In districts B, D, E, and I, though the contractor's work was largely predominant, there was more of the work of other hands seen than in A or F; and in D and I especially (districts respectively of Mr. Ness, of Helmsley, and Mr. Cockroft, of Catterick), there was scarcely a child, if one, who had been vaccinated by either of them, who had not four most perfectly typical cicatrices.*

Bad vaccination in Hull;

While such vaccination as this ought always to be attainable, it was most lamentable to see the amount of second-rate and bad vaccination which prevailed in a large number of the districts I was called upon to inspect. I have had occasion to allude to the vaccination of Hull. In that portion of the town which is comprised in the Hull Incorporation (for the vaccination in that part which is Sculcoates Union had been much better done) nearly one third of the children examined who had marks of vaccination had either imperfect marks, or but one or two marks only tolerable. In the baby classes of one infant school, out of 56 children nominally vaccinated, there was not one who was properly protected, that is, who had four genuine vaccine marks; only nine had as many as three good marks; the marks in 17 were only tolerable; and in another 17 they were imperfect. For such results I can conceive no excuse. At Dowlais, in the union of Merthyr Tydfil, I examined a large number of children: the eldest were fairly vaccinated; those done within the last three years (the present contractor having been appointed three years ago) were exceedingly well vaccinated; but the vaccination of children from three to seven years old and upwards was scandalously bad. The remarkable difference caught the attention at once of the schoolmasters who were present when I was examining the children. Some, indeed, of the vaccination was nothing more than a sham, and to a great deal of it I had occasion to call the attention of the guardians, as "not of the kind which parents have a right to expect when they "take their children to the public vaccinator, nor as guardians have "a right to expect when they pay public money for the performance of vaccination." In other places I had to call the attention of the local authority to the bad way in which the vaccination had been done. While certain specially bad districts like these go far to make up the unsatisfactory general result I have had to report, it must also be confessed that the number of districts was very considerable in which second-rate and imperfect vaccination was seen to an extent that could not be possible, if due care and skill had been applied.

in Dowlais, &c. &c.

* I have had occasion repeatedly to find that the possession of high professional qualifications by no means necessarily implies that a practitioner is a good vaccinator. Mr. Cockroft, himself a first-rate vaccinator, illustrated this to me by the instance of an assistant who had taken high professional honours, but vaccinated so badly that, according to his own account, he could not make his vaccinations succeed more than four times out of five.

III. Arrangements for the performance of Public Vaccination, and their Influence on the Amount and Quality of Vaccination.

In describing summarily the arrangements made for the performance of public vaccination in the inspected unions, the manner in which these arrangements were carried out, and the way in which the regulations issued under the Public Health Act for the better performance of public vaccination were observed, I shall consider successively the duties (1) of Guardians, (2) of Contractors, (3) of Registrars.

Arrangements, and their influence on the vaccination.

1. Duties of Guardians.—These, in reference to vaccination, are (*a*) the division of unions, if need be; (*b*) the appointment of vaccinators and of stations; (*c*) the fixing attendances; (*d*) the supervision of the fulfilment of duties by contractors; (*e*) the issuing of public notifications in accordance with the 1st sect. of 16 & 17 Vict. c. 100; (*f*) the institution of proceedings against parents in cases of neglected vaccination.

Division of unions:

(*a*) *Division of unions.*—With the single exception of the small union of Kirkby Moorside, each of the unions inspected was divided into districts for public vaccination, the districts being in almost every union co-terminous with the districts for medical relief. The division adopted was in most of the unions a convenient one, but in several populous unions it interfered more or less with the good performance of vaccination, and in three to such an extent that I felt it incumbent on me to recommend the guardians at once to revise their arrangements.

Often carried to an extent which greatly impedes good vaccination;

As in York,

The city of York forms part of the union of York, and comprises more than two-thirds of the population of the union. The births are from 1,400 to 1,500 annually,—a number which, after deduction for deaths and for private vaccinations, would leave applicants enough for public vaccination to maintain, with a weekly performance of vaccination, one first-rate station. By means of such a station, vaccination direct from the arm, under proper conditions of selection, might have been secured for every child publicly vaccinated; and a regular weekly supply of liquid lymph put within reach of the medical practitioners of the city for their private vaccinations.* But by the arrangement which had been adopted, the public vaccinations were divided among five vaccinators. The maintenance of continuous arm vaccination by either of them had, by this subdivision, been rendered simply impossible; a very large proportion indeed of the vaccinations of the city had been performed with dry lymph, and, in the practice of four out of the five contractors, public vaccination had been repeatedly suspended for weeks, and even for months together. One, indeed, of these had only performed 13 public vaccinations in three years. Such arrangements could not but be very prejudicial to the amount, as well as to the quality, of public vaccination, and in no important town have I met with greater

* This is a matter of great importance, the private as well as the public vaccination suffering from the want of proper stations in our large towns. One of the private practitioners of York stated to me the great difficulties he was often in with regard to lymph, and the frequency with which he was obliged to send to London, and to use, of course, preserved lymph. That such difficulties should be allowed to continue in a city like York appears to me simply scandalous. In the town of Swansea, with a much smaller population, but in which the public vaccination is all carried on at one station, I met, on occasion of a recent visit to the station, two of the private practitioners of the town, each of whom had come to "borrow" a child whose arm was in a state to supply lymph for the performance of some vaccinations, and each of whom expressed to me his sense of the great advantages which the station afforded them.

evidences of neglect of vaccination than in York. I accordingly advised that the system should be changed; that the existing contracts should be terminated; and that all the public vaccination of the city should be carried on at a central public station.

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This recommendation, notwithstanding the endeavours of some of the guardians to give it effect, was not, as I have recently learnt, ultimately adopted by the Board. I was aware, indeed, in making it, of one difficulty it was likely to encounter, the public vaccination being very generally regarded by the guardians as a *perquisite* of the district medical officers,—one of the inducements which were held out to them to accept their district appointments at low salaries. Under this view, (which I have found also to prevail in many other large towns) the arrangements for public vaccination are not made to depend on that on which, as it appears to me, they should alone depend,—the interests and advantage of the public in the proper performance of vaccination, but they are made subservient to certain other arrangements with which they have nothing essentially in common, and which are often, as they were in York, entirely at variance with those interests. I can conceive no subject requiring more serious consideration than this; it illustrates one of the evil consequences which have resulted from the connexion of public vaccination with the poor law system.

in Hull,

The town of Hull is situate partly within the Incorporation of Hull (the whole of which is comprised within it), and partly in the Union of Sculcoates. The Governor and Guardians of the incorporation have divided their portion of the town into two nominal districts, for the public vaccination of which they have appointed 18 vaccinators; and as to each of these, except one, two days of attendance a week are prescribed, there are in this portion of Hull 35 weekly attendances for the performance of public vaccination. The annual vaccinations performed were, on an average of three years, 1,627, which would give the $\frac{1}{46.5}$th part of a vaccination for each prescribed attendance. The working of this arrangement had been, that no single vaccinator had been able to maintain continuously his arm-vaccination, and that there was no single place to which a parent, taking his child on one of the appointed days, could (without previous inquiry) have any assurance of finding there another child from whom the lymph might be *directly* transferred, still less of finding any number of children from whom the lymph might be *selected*. Six of the vaccinators, by the performance of all, or nearly all, their vaccination on one week day, and by previous private arrangements, did every thing which was in their power to keep up the succession of arm vaccination, and their vaccinations were performed under the best conditions that the circumstances admitted; but to do this, even to the extent to which they were able, they had repeatedly to depend on a single child a week, and were thus deprived of the great advantages of *selection* in the transmission of their lymph. Some of them, desirous of securing the same advantages, but finding that their numbers were quite inadequate to keep on continuous vaccination, suspended vaccination altogether, except periodically. Others, (and these performed no inconsiderable part of the vaccinations), made no attempt to keep up arm vaccination at all, performing even many of their so-called public vaccinations at the people's dwellings. Hence in this, the most thickly-peopled part of this important town, where, if anywhere, children should have had invariably the advantage of the best arm-vaccination, a large proportion of the vaccination was carried on with dry or otherwise preserved lymph. I have already alluded to the exceedingly large proportion of badly performed vaccination which I met with in this division of Hull; and it is especially note-

worthy (1) that this bad marking was chiefly seen among the children who had been vaccinated within the last few years,* and (2) that the quality of vaccination in the part of Hull which was situate in Sculcoates, where a different system of public vaccination obtained, was notably better.† The plan of open vaccination adopted by the Hull Incorporation with such injurious results, had undoubtedly been dictated by a desire on the part of the governor and guardians to encourage the practice of vaccination (of which desire I had otherwise abundant evidence); and the apparent working of it in this respect was at first sight satisfactory, the infantile public vaccinations ordinarily exceeding 70 per cent. of the registered births. But closer inquiry showed that these advantages were fictitious, the tendency of the system being to bring in to the public account a number of vaccinations which otherwise would have been privately performed. On examination of a very large number of children in the Hull and Sculcoates charitable schools respectively, the proportion found unvaccinated was identical, seven per cent. in each; and on comparing the infant schools only of the two unions, the comparison was rather unfavourable to Hull, the proportion unvaccinated in the Sculcoates schools being slightly under eight, and in the Hull schools slightly above nine per cent.

At a meeting of the Hull Board of Guardians, I pointed out to them the inconveniences and disadvantages of the existing arrangements, and recommended them to divide the union, irrespectively of their poor law arrangements, into two districts, with a station for the weekly performance of public vaccination in each. In answer to inquires I had occasion to make, I was subsequently informed by letter from the clerk that "the guardians appointed a committee to consider the whole "question, and the committee, after several meetings, were unable to "recommend to the board any improvement upon the arrangements "for carrying out this (the Vaccination) Act, and accordingly recommended the board not to make any alteration," and that no alteration had been made.

The town of Cardiff, in the union of Cardiff, has a closely aggregated population of upwards of 30,000, and has, therefore, every means of giving, by proper arrangements, arm-vaccination (under the best conditions as to selection) to every child publicly vaccinated. But the vaccination was divided among four vaccinators, and vaccination from the arm at all was the exception and not the rule, the four contractors stating the proportion of children thus vaccinated by each respectively as "not more than a third;" "probably 1 in 4;" "about 1 in 4;" and "a very small proportion." And in two of the four districts the public performance of vaccination was sometimes suspended altogether for several months consecutively. Vaccination altogether was most irregularly and insufficiently carried on; and notwithstanding that the guardians had, some months before my inspection, had their attention in Cardiff,

* This is important, for it is only within the last few years that the open system has obtained. There were originally three public vaccinators for Hull: their appointment being independent of the poor law arrangements. After some years the poor law medical officers were appointed in addition; and still later the system was thrown open. Each step has been a step for the worse.

† Of the vaccinated children in the Hull infant schools, only 57 per cent. had good vaccine marks, 26 per cent. had tolerable marks, and 17 per cent. had marks which were bad and imperfect. Of the vaccinated children in Sculcoates infant schools, 75 per cent. had good marks, 17·5 per cent. had tolerable marks, and only 7·5 per cent. had marks which were bad and imperfect. If from the Hull schools I exclude St. Stephen's, which contained many Sculcoates children, the result would be still more unfavourable to Hull, for the proportions would then be 55 per cent. with good marks and 19·5 per cent. with bad marks.

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and, to a less extent, in other places.

called to the subject by their clerk, and that considerable exertions had consequently been made, I yet found one-fifth part of the children in the infant schools unvaccinated. I recommended to the guardians the same course that I advised for York; and I have since heard that a committee has been appointed to consider the subject. Cardiff was one of my latest inspections, and it is probable that no result has yet been arrived at.

There was a certain but much less degree of unnecessary subdivision in the Sculcoates part of Hull, in Newport (Monmouthshire), in Whitby, and in Beverley. The arrangements would have been greatly improved by the substitution of two for four public vaccinators in Sculcoates, and by the appointment of one instead of two public vaccinators in each of the other places; and I recommended that at the first convenient opportunity this arrangement should be adopted.

Good arrangements in Swansea.

In contrast with the arrangements at York, Hull, and Cardiff, it may be expedient that I should here advert to the arrangements in Swansea. The public vaccination of this town is carried on entirely at a single station, at which vaccination is performed once a week. The result is, that no child has for years been vaccinated otherwise than from the arm of another child; that there is a constant weekly supply of liquid lymph in the town, of which the profession largely avail themselves; and that Swansea is the numerically best vaccinated large town which I have visited in the course of three years' inspections.*

Appointment of vaccinators.

(*b.*) *The appointment of vaccinators.*—The overseers or guardians of the parishes and townships in the Bainbridge Incorporation, and of five adjacent townships not included in any union or corporation, had made no appointment of public vaccinators. In all other districts a vaccinator or vaccinators were appointed. But for 15 districts there was no legal contract; in five the contract made had not been submitted to the Poor Law Board for confirmation; and for 11 the existence of contracts was a matter of doubt. In three of the districts in which there was no contract, the vaccinators appointed had not the proper legal qualifications. The fee was usually the legal minimum: but in the unions of Easingwold, Guisborough, Richmond, Leyburn,

* I subjoin the results of examination of children in the charitable schools, &c., of the above-named places:—

Town.	Proportion unprotected against Small Pox in every 100 Children examined.	
	In all Schools.	In Infant Schools.
Cardiff	12·3	18·3
York	9·6	11·3
Hull	6·0	7·7
Swansea	4·2	4·2

In Cardiff, and especially in York, the result would have been much more unfavourable but that many of the children in the schools had been recently vaccinated: in Cardiff, on account of the exertions referred to in the text; in York, on account of the alarm arising from the epidemic of small-pox.

and Bedale, in Yorkshire; Chepstow and Newport in Monmouthshire; and Gower in Glamorganshire, 2*s.* 6*d.* was paid for all vaccinations, irrespective of distance. The fees in Thirsk were 2*s.* and 3*s.*; in Scarborough Union, 1*s.* 6*d.*, 2*s.*, 2*s.* 6*d.*, and 3*s.* 6*d.*; in Patrington, 2*s.* and 3*s.* 6*d.*; and in Stokesley, 1*s.* 6*d.* and 5*s.*, according to distance.

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

(*c.*) *The fixing attendances for the performance of vaccination.*— These were for the most part of the same kind, and open to the same objections on account of their diffuseness, as the arrangements described in previous reports. The absurdity, however, of "daily" attendance for the purpose of vaccinating seemed to be well appreciated in Yorkshire, in which I only met with seven contracts which required it, four of these being for the city of York. It was directed for 21 districts in Wales, and for two more there was attendance provided *twice a day*. In two districts the daily attendances professed to be given from 10 to 4 o'clock. Attendances twice a week were required by 21 contracts, 17 of which were in Hull. Other attendances were weekly, monthly, in alternate months, or quarterly. Many of the stations with weekly attendance, as some of those in Merthyr Tydfil Union, in the Neath and Swansea Unions, and in other thickly-populated parts of the mining districts, worked admirably. In some districts these weekly attendances were regularly maintained at the contractor's surgery, when from the limited amount of population periodical attendances would have answered better. And in a large number of districts the weekly attendances were much in excess of the number of children to be vaccinated, and from their uselessness had been discontinued. The system of attendances monthly or in alternate months, directed in 93 contracts, was observed by one contractor only. A system of attendances directed for three or four successive weeks every quarter, worked exceedingly well in the Grosmont district of Whitby, in the Helmsley district of Helmsley, and in two or three other districts. But the unpractical character of the prescribed arrangements generally is shown by the fact that of the 197 contractors, there were only 34 who professed uniformly to give all the attendances required of them, and that of these only 24 carried on the vaccination of their districts entirely in conformity with those arrangements. There were 16 who partly adhered to their contract engagements; but 147 disregarded these altogether. In reference to this general disregard of contract obligations, and to the indispensable necessity of *bonâ fide contracts*, as the foundation for securing that observance of duty on the part of those appointed to vaccinate to which the public has an absolute claim, I must repeat what I have stated in former reports, that binding arrangements cannot, in my opinion, be made for the vaccination of small towns, and of districts in which vaccination can only properly be carried on periodically, under the present law as interpreted by the Poor Law Board; and that such alterations in the statute as will admit of proper provisions for periodical vaccination in these districts are of pressing importance.

Attendances for the performance of vaccination, as directed by contracts, were generally of an unpractical character, and disregarded by the contractors.

(*d.*) *Supervision of the performance of contractors' duties* appeared to be no where systematically exercised by the local authority. It is only necessary to refer to the cases in which districts were left a year or more without vaccination, and to others, hereafter cited, in which deputies were illegally employed and registers incorrectly kept, to show how much such supervision was called for.

No supervision of contractors by the local authority.

(*e.*) *The public notifications required by the statute* were, except in three or four unions, neglected altogether, save at times when there

Public Notifications.

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was immediate fear, or presence, of small-pox. Even under such circumstances, they were not always issued. In Cardiff, for instance, there had been no issue for 10 years, notwithstanding the frightful epidemic of small-pox, which ravaged the town in 1858–9. No notices had been put out in Whitby, though a severe epidemic had at the period of my inspection been sometime raging, until the special attention of the authority had been called to the point by the Lords of the Council. Neither were any put out in York till the epidemic had done half its work, nor till the attention of the guardians had been also called by their Lordships to the matter. Nor had there, when I made my inspection, been any notices in Sculcoates, nor in Swansea; though in both small-pox was prevailing. In Hull the utmost attention had been given to this point, and there was no part of the town, no court or alley, in which such notices were not to be seen.

It was the custom of most Boards, however, to issue notices when small-pox prevailed. Notices at other times had only, so far as I could get precise information, been issued, at all events within the last six or eight years, in the unions of Hay (in 1859, and again in 1861), of Chepstow (usually once a year, and now more frequently), of Merthyr Tydfil (every year or year and a half), of Newport (where no placards are issued, but very frequently notices are given in the local newspaper).* It is of especial importance in large towns that notice of all the arrangements made should systematically be given. No parent, immigrating into Cardiff, nor into York, or Swansea, at any time between 1859 and 1863, had any proper public means of ascertaining when and where he could get his child vaccinated.

Proceedings.

(*f*.) *Proceedings* for enforcement of vaccination in cases of neglect had not actually been taken by the local authority in any of the inspected unions, but several Boards had appointed their clerk or other person to take proceedings; and I was assured that proceedings had only not been taken because in every instance a preliminary notice to the parent had sufficed to get the child vaccinated. The guardians of Chepstow had recently given public notice, requiring all persons in disregard of the law to have their children vaccinated within six weeks; and the Board of Northallerton had directed the registrars to send notice to the parents of all children whose vaccination according to law was not registered, requiring them to have their children vaccinated within seven days. But the faulty provisions of the statute, in regard to the registration of vaccination and the necessity of always proving the delivery of a notice to the person summoned, were complained of as great, and in many instances, insuperable obstacles to the effectual attainment of the objects of the law. In several unions proceedings had been taken by the public vaccinators, and the districts in which they had been so taken were uniformly among the numerically best vaccinated which I inspected.

II. Duties of Vaccinators.—These are (*a*) to give proper attendances for the performance of vaccination; (*b*) to attend personally or by legally qualified and legally recognized deputy; (*c*) to perform their vaccinations in conformity with the instructions laid down; (*d*) to inspect the results; (*e*) to keep registers; (*f*) in successful

* In many unions the vaccinating arrangements were printed in the clerk's half-yearly abstract, but this (though useful in its way) is not the form of notification required by the statute.

Local Inquiries as to Vaccination.

cases to deliver certificates to the parents, and duplicates to the registrars.

(*a.*) *The attendances for vaccination* directed by contracts were, as I have said, in several districts regularly and efficiently given, but were in the great majority of districts (and usually with good reason) disregarded. Occasionally this setting aside of contract obligations had been with the direct assent of the local authority; but usually the guardians had been passive and acquiescent only, concerning themselves, indeed, with little as regarded vaccination, except paying the bills, and leaving the arrangements wholly to the medical men. In either case the vaccinators were fairly responsible for the arrangements actually in force. In inquiring into these, my duty was (1) to ascertain whether, in place of the discarded appointments, opportunities for vaccination were regularly and systematically given; and (2) how far these opportunities were in accordance with the positive instruction "Endeavour to maintain in your district such a succession of cases "as will enable you uniformly to vaccinate with liquid lymph directly "from arm to arm; and do not, under ordinary circumstances, adopt "any other method of vaccinating." There were several districts in which the arrangements which the contractors had made were such as, in my opinion, admitted of no improvement. At periods, two or three in the year according to the population of the district, two or more children were vaccinated by lymph obtained for the purpose. Notice was given to the parents generally, and the vaccination was carried on from week to week till there were no more applicants; these appointments being made at the surgery for those who lived within a reasonable distance, and for others in the respective villages. When this plan was carried out regularly and systematically, the vaccination was uniformly as satisfactory as to its amount, as it was with regard to its success. The vaccinators of some districts went round with the same regularity to the individual dwellings of parents; and where, the districts being small or little populous, their personal knowledge of the district gave them the means, or where they otherwise took means, of ascertaining who were the children requiring vaccination, the result numerically was satisfactory, but the neglect of the instruction quoted caused the children to be vaccinated at great disadvantage. But for most of the districts in which the *contract arrangements had been* superseded, I am obliged to report, *in answer to my inquiries on the* first point, that opportunities for vaccination were *not regularly and* systematically given at all, but were *only given from time to time as* it *suited* the vaccinator's convenience; *and that in no districts in* which the arrangements were not very precise and systematic was had the numerical state of vaccination at all satisfactory. In many of these districts the attendances were only given at very long intervals.* In many, or most of them, they did not afford those opportunities for public vaccination which the law directs, but consisted in the domiciliary visit of the vaccinators, such domiciliary visitations being generally very incompletely carried out, inasmuch as individuals not known to the vaccinator, or upon whom (as considering them the patients of other medical men) he did not choose to call, were without the opportunities for gratuitous vaccination to which by law they were entitled; while the system obliged parents generally either to

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

Attendances for the performance of vaccination as given by the contractors

were in some districts very regular and systematic,

but in most were irregular; and parents had not the opportunities which they ought to have.

* One of the practitioners of Malton told me that a woman from a distant village in another union had begged from him some lymph to vaccinate her own child, for the doctor of her district *did not vaccinate*. On looking to the returns made annually to the Poor Law Board, I found that in fact he had made no return for three years.

accept the dry-lymph vaccination to which they so much object, or to leave their children unvaccinated at the risk of penalty. And, in answer to my inquiries on the second point, I have to report that, in the practice of far more than two-thirds of the contractors who virtually made their own arrangements, there was a most unnecessary amount of dry-lymph vaccination; that many performed scarcely any other than dry-lymph vaccination; and that the results of vaccination were thereby injuriously affected.

And there was a most unnecessary amount of dry-lymph vaccination.

Employment of deputies.

(*b.*) *Deputies.*—The attendances for vaccination were stated to be given always personally by 147 of the contractors. By 50 the vaccination was performed more or less by deputy. In no case had the qualification of these deputies been inquired into by the local authority, as the regulations require.* And as regarded 22 of them it was admitted that they had no professional qualification whatever. Several of the remainder, though holding a diploma, had not the qualifications which the law requires for a deputy.

Performance of vaccination.

(*c.*) *Performance of vaccination.*—The direction in vaccinating to make four or five separate punctures, so as to produce four or five separate good-sized vesicles, or if operating otherwise than by punctures to produce equivalent local results, was very imperfectly carried out. Of 66 vaccinators operating by puncture, only 16 made as many as 4 punctures; 31 made 3; 17 made 2; and 2 made one only. Of 116 vaccinators operating by abrasion, scarification, or tattooing, 40 operated over surfaces which would produce compound vesicles equivalent to 4, and often to many more than 4, ordinary good-sized vesicles; the operations of 38 were over surfaces equivalent to 3 good-sized vesicles; of 27 over a surface or surfaces equal to 2 good vesicles; and of one over a surface which would only produce a single vesicle of ordinary size.† Thus, by a large majority, the amount of infection aimed at was very insufficient: several of the vaccinators alleging that this course was forced upon them by the exigences of a dry-lymph system, as they could not afford a child more than two or three points. Except when the vaccination was performed with liquid lymph, the result also fell very frequently short of the effect that was aimed at. A few dry-lymph vaccinators professed that they could make their vaccinations take as well as by any other method, but observation of children in their districts generally showed how far the number of marks fell short of the insertions they stated had been made. But in point of fact the greater relative failures of this mode of conducting vaccination were generally acknowledged.‡ The few registers, of those which passed

* In illustration of the care which guardians ought to exercise with regard to the employment of deputies, I may state that in an industrial school which I inspected, in which there had been general vaccination and re-vaccination by a deputy, said to be a qualified medical man, who made always three punctures, there was no child recently vaccinated who had more than two marks, and three out of five had only one. Re-vaccination had not only been performed and charged for on children with good marks of vaccination, but on children who had had small-pox. Two children entered as successfully vaccinated in the register had no mark resulting, and both stated that their arms did not rise. In seven other cases there were slight marks of success.

† The practice of 15 vaccinators was not ascertained.

‡ Thus, taking eleven districts in which the vaccination was performed almost exclusively with dry lymph, and in none of which was it the custom to insert lymph in less than two places, while in some it was inserted in three, four, or more places, I find that upwards of 30 per cent. of the children examined (446 out of 1465) had but one mark. In a district in which it was the practice to make six insertions, only

through my hands, which correctly exhibited results proved this. In one house to house district, there were 29 failures in 207 vaccinations; in another 14 in 107; in another 43 in 335; in another 50 in 282; in another 10 in 51; and in one 15 in 22. I may contrast with these one district in which the vaccinations were almost uniformly performed from the arm, and in which in 1,270 vaccinations there were but 17 failures.

Inspection of results.

(*d.*) *Inspection of results.*—By the majority of contractors the results were said to be invariably inspected before they were reported. Out of 69 vaccinators of whom I inquired specially on this point, 17 admitted that the cases were not always seen, and that a parent's report was considered evidence enough on which to record success and even to deliver certificates. Some did not even go to the extent of requiring this evidence, but assumed success if the child was not brought back.

Registers.

(*e.*) *The registers*, with few exceptions, were kept rather as accounts with the guardians than as records of proceedings in the discharge of public duties. In a few districts no registers were kept at all, and in several the books were kept in such a slovenly way, as to afford little or no reliable information. Success of operations was only properly shown in a very few registers, and in none were there means of tracing the lymph which had been employed in the respective vaccinations; in only one or two were secondary distinguished from primary cases of vaccination.

Certificates of successful vaccination.

(*f.*) *Certificates to parents* were said to be given by most vaccinators, and *certificates to registrars* by nearly all. I made minute inquiry on this point, of 68 vaccinators; 40 said they always gave them to parents, the others that they gave them sometimes, or when they were asked for, or not at all; 64 said they gave them always to the registrars, and four that they did not do so. Many, however, who professed to send these certificates to the registrars did this very irregularly, and at very long intervals; and it was quite certain that in a great many of these districts there were many children publicly vaccinated of whose vaccination the registrar had no account. It is highly to be desired that the provisions in this respect of the Vaccination Act for Scotland of last session should be made to apply to England.

Delivery of notice to parents by registrars.

III. DUTIES OF REGISTRARS.—(*a.*) The statutory notice in regard to vaccination was habitually omitted by the registrars of the sub-districts of Sutton and Knayton, in the Thirsk Union; of Sherburn, in the Scarborough Union; of Lockton, in the Pickering Union; of Askrigg, in the Bainbridge Incorporation; and of the eastern district of Gower. It was stated to be occasionally, but very seldom, omitted by the registrars of the sub-district of Westow, in the Malton Union; of Kirkleatham,* in the Guisborough

74 out of 147 children had more than two marks; several children had been cut again and again; and one four times. In my notes are repeated entries of this kind: "Mr. P. says they take very badly, have often to be done two or three times over." "Of 54 children 15 had but one mark, three had been tried twice without effect, "and one three times." "Mr. R. says he has often to do them a second time before "they will take, and sometimes three or four times." "Mr. W. says they take very "badly; the number of vesicles varies much; he always inserts six points, but often "only one or two take," &c. &c. These entries have not reference to wild country districts, in which it might be supposed the use of preserved lymph was a necessity; the very first of them, for example, was the statement of a public vaccinator of the city of York.

* Not 50 times out of many thousand notices.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

Information as to attendance for performing vaccination was generally misleading.

Minute Book.

Entry of certificates.

Union; and of Patrington, in the Patrington Union. By the remaining 83 registrars of the unions in the North and East Ridings, and 63 registrars of the unions inspected in Wales, the delivery of the notices was stated to be invariable. (*b.*) The information as required by the statute, with regard to the times and places at which attendance should be given for public vaccination, was given to parents in conformity with the contract arrangements, for 145 entire vaccinating districts, and for portions of 15 others; but for 99 entire districts, and for parts of 12 others, this information was incorrect and misleading. Only for 44 entire districts, chiefly districts in South Wales, 11 being in one union (Merthyr Tydfil), and for parts of three others, was it in accordance with the actual vaccinating arrangements. For seven districts, and for parts of three districts, arrangements were notified not in accordance with the contracts; and for 32 entire districts, and parts of 18 others, no arrangements whatever were notified. (*c.*) The minute of delivery of notice was not made by 26 registrars, and the minute book of four others was between 6 and 12 months in arrear. (*d.*) The certificates of successful vaccinations were not entered at all by 16 registrars; the books of five were from 6 to 12 months in arrear; and the certificates were entered, but not in conformity with the registrar-general's instructions, by nine registrars. The registers of the remaining 125 registrars were correctly kept in both respects. In a few of these districts, in consequence of the pains of the registrar, and the proper fulfilment of duty by the respective vaccinators, the registers represented very closely the actual state of vaccination. But the negligence of vaccinators rendered the books in the great majority of districts very worthless for this purpose.

The following are the sub-districts in which registrars had neglected their books altogether, viz., Bootham, in York Union; Pickhill, Sutton, and Knayton, in Thirsk Union; Lockton, in Pickering Union; Bainton, in Driffield Union; South Cave, in Beverley Union; Marske and Guisborough, in Guisborough Union; Aldborough, in Richmond Union; Askrigg, in Bainbridge Incorporation; Devynnock and Llangorse, in Brecon Union; Cwmdû, in Crickhowell Union; Cadoxton, in Neath Union; and Llandilo-Talybont, in Swansea Union.

The following are the districts in which the books were from 6 to 12 months in arrear, viz., Thirsk, in Thirsk Union; Foxton, in Driffield Union; Market Weighton, in Pocklington Union; Newsham, in Richmond Union; and St. Wollos, in Newport Union. The books had been misunderstood, and only certificates entered by the registrars of the following sub-districts: Lastingham and Allerstone, in Pickering Union; Hedon, in Sculcoates Union; Hutton, in Stokesley Union; Kirkleatham, in Guisborough Union; both districts of Bedale Union; Patrington; and Penkelly, in Brecon Union.

IV.—SMALL-POX.

Epidemic of 1857–9.

In the great epidemic of small-pox of 1857–9, cases had occurred in nearly all the unions now reported on. In many, both of those in the North and East Ridings and in Wales, the disease had been excessively fatal. In some of the Welsh unions, as at Cardiff and in Merthyr Tydfil, there had been a mortality scarcely credible. The following table exhibits the deaths from small-pox in the inspected unions during this epidemic, and subsequently to the end of 1862.

TABLE VIII.

Showing the Mortality from Small-pox in the inspected Unions, 1857–1862 :—

Deaths in inspected unions for six years.

REGISTRATION UNION.*	Deaths from Small-pox.					
	1857.	1858.	1859.	1860.	1861.	1862.
York	76	37	1	5	—	61
Pocklington	—	3	—	1	—	1
Howden	—	2	—	4	—	—
Beverley	4	1	1	4	—	1
Sculcoates	15	5	5	3	1	2
Hull	10	43	11	12	7	1
Patrington	—	2	—	—	—	1
Skirlaugh	2	1	1	1	—	1
Driffield	1	5	—	1	—	—
Bridlington	—	1	—	2	1	—
Scarborough	18	1	11	20	6	2
Malton	3	—	—	—	1	1
Easingwold	4	4	—	1	—	—
Thirsk	3	2	—	—	—	1
Helmsley	—	—	—	1	—	2
Pickering	—	—	—	—	—	—
Whitby	—	—	—	2	—	8
Guisborough	—	—	56	15	—	1
Stokesley	—	—	—	—	—	1
Northallerton	1	1	—	—	—	—
Bedale	—	1	—	1	—	—
Leyburn	—	—	—	—	—	—
Askrigg	—	—	—	—	—	—
Reeth	—	—	—	—	—	—
Richmond	1	1	1	—	—	2
Ross	3	18	8	1	—	—
Hay	—	5	11	—	—	—
Builth	—	3	4	—	1	—
Brecon	1	31	4	1	—	—
Crickhowell	18	32	1	—	—	—
Abergavenny	37	159	8	—	—	—
Bedwellty						1
Chepstow	1	7	2	—	—	—
Newport	32	68	4	1	1	1
Pontypool	22	22	—	—	—	—
Monmouth	1	2	4	—	—	1
Merthyr-Tydfil	95	609	1	—	2	1
Cardiff	215	36	—	2	1	3
Cowbridge and Bridgend	1	13	—	—	—	—
Neath	37	159	1	2	—	1
Swansea	7	94	12	—	—	—
Gower		3	—	—	—	—

The epidemic period which set in during the second half of 1862 had already at the time of my inspection made itself severely felt in several of the unions of the North and East Ridings. In York the disease had nearly run its course; at Whitby and Hull it was extensively prevailing. In numerous other places there had been outbreaks, more or less extensive, and more or less fatal. In fact, in all the unions of the two

Epidemic of 1862–4 prevailed, at time of inspection, throughout the N. & E. ridings.

* The Registration Union of Helmsley includes the unions of Helmsley and Kirkby Moorside; the Registration Union of Askrigg includes the Bainbridge Incorporation and the unincorporated adjacent townships.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

Ridings, except three, cases of the disease had occurred or were in progress. Whenever it was possible to ascertain the origin of the outbreak in any town or locality, this was found to be invariably traceable to importation; and in several unions the cases which had occurred had been *only* imported cases, the disease not having spread, at least up to the time of my inspection. York and Whitby were the great plague-centres whence the East and North Ridings were infected. I did not meet with small-pox in any of the Welsh unions, except Builth and Swansea. Swansea was the union most recently inspected, and the disease had not begun to prevail till quite the end of the year. It is probable, indeed, that the epidemic period is only now commencing in South Wales.

The conditions under which the small-pox fatally prevailed were invariably those of great neglect of vaccination, aggravated by bad sanitary conditions and over-crowding.

especially at York;

In York these combined conditions had resulted in a most serious mortality. Although, at the period of my inspection, the epidemic had not terminated, the deaths amounted to 100, *or proportionally more than threefold the mortality which created such just alarm in the metropolis last year.* I have already stated the extreme neglect of vaccination which prevailed; and I did not find that during the early days of the epidemic, any steps had been taken by the local authority to rouse public attention, and to secure the protection of the population. Yet for this there was time: for the disease began to spread in August and September 1862, but it was not till November, December, and January that it reached its period of greatest fatality; and if in this interval due warning had been given, followed by enforcement of the law in a few cases for the sake of example, it is not to be doubted that the greater part of the mortality might have been averted. The sanitary condition of some portions of the city in which the disease had much prevailed, was as bad as can well be conceived.

At Whitby;

Whitby had suffered more in proportion to population than any place after York. There had been small-pox in the town as early as October 1862, but the disease had not spread till December; it had up to the time of my inspection been fatal in 25 cases, and was by no means then declining. Of the 25 persons who died of it, six were adults, four were under the age by which non-vaccination becomes illegal, one was a child born before the passing of the act, and 14 were children illegally unvaccinated. Notwithstanding the pains taken at all times by the two public vaccinators, the state of vaccination was not satisfactory; and the Board had not, until receipt of a communication from their lordships in February, taken any active measures on account of the epidemic. They then issued notices, and directed their clerk to proceed against offenders, but the persons selected for proceedings having got their children vaccinated, no summonses had actually been taken out. At a meeting of the Board which I attended, further and more peremptory instructions were given to the clerk. The sanitary condition of parts of the town was very unsatisfactory.

And in Hull.

In Hull the epidemic had begun early in the year, and at the period of my inspection (in May) there had occurred 37 deaths in the Hull Union, and 19 deaths in the Sculcoates Union. Many cases were under treatment, and there were, no doubt, other deaths subsequently. In Hull the guardians had issued public notices freely; in Sculcoates no measures had been taken by the Board, but the public vaccinators had been very active. And in both unions a large amount of vaccination had been performed, which had evidently checked the course of the epidemic. But there were yet many unvaccinated children, and a

better system of public vaccination, and a systematic supervision of the observance of the law, were very much needed.

It is not necessary specially to refer to the other unions of the North and East Ridings, in which epidemic small-pox had recently prevailed, or was prevailing, in several of which the outbreaks were limited to particular districts, or to circumscribed localities within the union. Wherever these outbreaks were severe and fatal, it was invariably in consequence of neglect of vaccination; but there were several districts in which infantile vaccination had been carefully maintained, but in which numerous cases of small-pox occurred, always, however, in a mild and modified form. I did not hear of any case of death from small-pox in a child who had been successfully vaccinated; in several of the deaths of adults, vaccination was alleged, but the particulars were imperfect. In many of the adults it was known that vaccination had never been performed.

Also (in Wales) at Builth;

The outbreak in Builth (in the summer and autumn of 1863) was severe, and associated with great neglect of vaccination. There were 32 cases, almost without exception unvaccinated; and there were seven deaths, all in unvaccinated persons. Several of the cases, including two or three of those which were fatal, were in unvaccinated adults.

And Swansea.

The epidemic in Swansea commenced in October 1863, and did not spread till the end of the year. It was of brief duration, and at the period of my inspection, which circumstances delayed till the beginning of March 1864, was on the decline. The fatal cases had been 29; nearly all in unvaccinated children. In reference to this outbreak, it is desirable to refer to the statements with regard to vaccination in Swansea, at page 3.

Many places in which, as shown in this report, vaccination had been greatly neglected, had not been reached by the epidemic at the time of my inspection, and I was, therefore, enabled to give to the local authorities timely warning of the dangerous position in which they stood. In Bedwellty, Merthyr, Neath, Newport, and above all in Cardiff, in South Wales, this warning was very urgently needed; so also at Scarborough, and other places in Yorkshire. I may say that I found everywhere the greatest readiness, and generally even anxiety, to give effect to the various suggestions I had to make; and I trust that in most of the places the danger which was impending may have been averted. It would, indeed, be a signal disgrace if such mortality as overtook some of the Welsh unions in 1857–8, were ever seen again in this country. I have spoken of that mortality as scarcely credible. In Cardiff it was in proportion to population fourfold, in Merthyr it was tenfold that which occurred in the metropolis last year, in the severest outbreak with which London has been visited for 20 years.

V.—Recommendations and Suggestions.

I made to the various boards of guardians, and to the officers concerned with the local administration of public vaccination in the respective unions, such suggestions for the more regular maintenance of vaccination, and for the more effectual performance of vaccination, as in each appeared to be called for,—the best which, in the present state of the law, I was able to offer. But the inspections of this year have but confirmed the conclusions to which I had been led by former inspections, that without amendment of the law, its objects will continue to be imperfectly attained.

2. In Yorkshire, Herefordshire, and Wales, by Dr. Seaton.

The alterations required consist mainly (1) in the better registration of vaccination, and especially in the removal of provisions in the present acts, which are actually obstructive to the proper registration of vaccination; (2) in enabling local authorities to appoint, and of course reasonably to remunerate, persons to supervise the observance of the vaccination laws; (3) in certain provisions indispensable for the better maintenance of lymph, and for the better and more regular performance of vaccination by the appointed public vaccinators. These provisions consist (*a*) in a power of control over the division of unions for vaccination purposes, and over the vaccinating arrangements, (analogous to that now exercised by the Poor Law Board in the confirmation of contracts) with a view of ensuring constant supply of liquid lymph and constant arm-vaccination in large towns and districts sufficiently populous, and periodical arm-vaccination in other districts; (*b*) in such relaxation of the law with regard to the age by which vaccination is required, as will enable arrangements for regular periodical vaccination to be legally made in all districts in which continuous vaccination cannot be properly maintained; and (*c*) in the systematic supervision of the fulfilment of engagements and observances of instructions on the part of contractors.

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

3.—DR. STEVENS'S SUMMARY of the RESULTS of his INQUIRY in certain UNIONS in YORKSHIRE, LANCASHIRE, CHESHIRE, and CUMBERLAND.

I beg leave to bring under your notice the following summary of my work during the year while engaged in an inquiry into the state of public vaccination in certain unions in the Yorkshire, North-western, and Northern registration divisions of England.

The unions inspected were 79, viz.:—all the 37 unions of the West Riding of Yorkshire, all the 30 unions of Lancashire, all the 11 unions of Cheshire, and one of the unions of Cumberland.

These 79 unions, embracing a population in 1861 of 4,498,695, and extending over 3,697,342 acres, were divided into 507 vaccination districts. The public vaccination therein was in the hands of 511 public vaccinators: 366 sub-district registrars were engaged in the performance of the duties in respect to public vaccination which by legislative enactments devolve on those officials.

I have had interviews with the clerks to the guardians, several of the guardians, and some magistrates, in all the unions visited; and I have had conversations with 403 public vaccinators, and 344 sub-district registrars, as well as with clergymen, and other persons having influence in the different inspected districts. Moreover, I have carefully explained to the teachers in all the public schools examined, the nature of my inquiry, and the appearances that should be found on the arms of the successfully vaccinated, and I have pointed out to them the groundlessness of the prejudices against vaccination, and what steps should be taken to secure the best results from that operation, and what precautions should be used by them against the spread of small-pox, should it appear in their schools.

I propose to epitomize the results set forth in the detailed report of each union which accompanies this, according to the method I adopted last year. A general view will be given, (1) of the quantity of public vaccination done in the unions visited as compared with the number of registered births; (2) of the quality, or amount of protection

afforded in each district, as derived from the inspection of the arms of children in 924 public schools; and (3) the cause of any defect that has been found either in quantity or quality. With a view to arrive at as correct an appreciation as possible of the way in which the efficiency of public vaccination is sacrificed or tampered with, I shall place before you, almost in a tabular form, a general synopsis of the information I have obtained under the several heads into which I divided my inquiries.

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

I. QUANTITY OF VACCINATION.

Information concerning the quantity of public vaccination done in a union is of two kinds; (1) that derivable from the annual returns made to the Poor Law Board by the clerks to guardians from materials afforded them by the public vaccinators; (2) that arrived at by the actual examination of the people. Both sources of information are somewhat fallacious, and the results obtained must therefore be considered only as approximative. For instance, the returns sent to the Poor Law Board embrace, in most unions, only the vaccinations of the public vaccinators, and often not all of those, as it has not been the uniform practice of these gentlemen to certify for and return to the registrars or guardians the vaccinations of their so-called private patients. These patients, in large manufacturing districts, where clubs for medical relief are common, form a large proportion of the population. Again, private (or non-contracting) practitioners do not, in a great majority of instances, make any return whatever of their vaccinations. This neglect materially affects the adequacy of the returns from large towns, as also from rural districts in the immediate vicinity of large towns. Again, in some places where the contractors and other practitioners certify all their vaccinations to the registrars, the public return does not come up to even tolerable completeness, owing to the almost universal practice of the clerks to guardians to return to the Poor Law Board only those cases which have been paid for by guardians. In some instances an examination of the registrar's registers of successful vaccinations has satisfied me that the vaccination of the neighbourhood was fairly complete; whereas the returns have shown a percentage of vaccinations, calculated on registered births, that would have led to very opposite conclusions. These are objections to the accuracy of the public returns as affecting unions. There is another which affects only the character of the districts. Clerks to guardians are in the habit of returning the vaccinations done by *each public vaccinator* opposite his name on the usual form; not the vaccinations *done in the district* for which that public vaccinator is the contractor. By this practice some energetic public vaccinators appear to push their activity so far as to throw undeserved doubt on the veracity of their returns. They vaccinate at their surgery or at some duly recognised station many inhabitants of a neighbouring district. These are not weeded out in the public return, and apportioned to the proper district; and the result is, that some vaccinators appear to vaccinate from 200 to 500 infants for every 100 born in their districts. A little care in the compilation of these returns would reduce these sources of error to a minimum.

The other mode of obtaining information as to the quantity of the vaccination of a district, by examining the arms of children at the public schools, is open to these objections. In the first place, adults entirely escape observation, and in the second place the very lowest and most neglected children are not sent to school. In these respects, pro-

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

bably, the results of school examination give a too favorable view. But as the children of the upper classes can in no case be examined, and as I believe it is fair to infer that they are more uniformly protected, this objection to the reception of the school children as a fair example is somewhat modified.

Both of the foregoing methods of obtaining information are, however, very valuable. It must be borne in mind that the same kind of public returns, almost invariably compiled in the same way, have been consulted in the case of every union I have visited; and in Sedbergh union I find they make the per-centage of infants vaccinated to registered births 88·9, and in Ripon only 21·5.

Analogous statements may be made, with far less source of fallacy, of school examination. Whereas in Bramley union I found unvaccinated 23·2 per cent. of the children examined, in Sedhergh union all but 2·0 per cent. had been protected.

The following table (Table A.) gives a list of the unions visited; the number of vaccination districts and of public vaccinators in each; the number of infants vaccinated in the three years ended 30th September 1862; the proportion of the infant vaccinations to the number of registered births in each union; the proportion of children found unvaccinated in the public schools per 100 of those examined; and the older vacinations (that is above one year of age) per 100 of the total vaccinations returned for the different unions.

TABLE A.—Showing the Number of Cases of Infant Vaccination per 100 of registered Births for Three Years ended 30th September 1862, also the Proportion of older Vaccinations calculated on the gross Number vaccinated, and the Per-centage found unvaccinated in the public Schools visited.

UNIONS.	Number of Districts.	Number of Public Vaccinators in each Union.	Infants vaccinated in each Union.	Infant Vaccinations per 100 of registered Births.	Older Vaccinations per 100 of Children vaccinated.	Found unvaccinated in public Schools per 100 of Children examined.	Estimated Value of the Vaccination in Unions; Perfection being taken as 1,000.
Barnsley	6	6	3,370	57·9	3·9	9·6	206
Barwick Incorporation	*17	17	1,081	†80·5	6·2	12·3	255
Bierley North	11	11	5,817	58·4	14·4	7·2	322
Bradford	7	7	4,936	41·7	17·5	10·4	252
Bramley	3	3	‡..	..	..	23·2	174
Carlton Incorporation	*21	21	3,972	73·0	13·2	10·8	243
Dewsbury	11	25	6,002	50·1	14·6	12·4	231
Doncaster	8	8	2,145	52·5	13·8	12·3	191
Ecclesall Bierlow	4	4	3,073	41·6	15·3	13·2	231
Goole	5	5	760	47·1	27·7	15·4	186
Halifax	13	13	8,497	61·6	10·7	10·9	241
Hemsworth	5	4	375	55·7	9·6	7·2	187
Holbeck	3	3	..	..	..	11·4	246
Huddersfield	18	18	8,963	61·0	5·1	7·8	289
Hunslet	3	3	2,514	76·4	1·2	12·9	236
Keighley	5	5	§999	36·7	37·5	12·1	168
Knaresborough	4	4	635	40·4	21·9	13·7	227
Leeds	4	6	10,071	73·8	4·3	12·5	192
Osseburn, Great	7	7	692	65·5	7·7	8·3	255
Pateley Bridge	4	3	624	63·5	30·8	9·5	316
Penistone	4	4	1,100	62·6	10·2	6·0	239
Preston, Great, Incorporation*	11	11	1,647	68·8	9·5	8·9	235
Pontefract	4	4	‡..	..	..	11·7	306
Ripon	4	4	324	21·5	20·0	11·8	190

* Not divided into districts.
† Calculated on birth returns, which were evidently defective.
‡ New union. No returns.
§ For 2 years only.

TABLE A.—*continued.*

UNIONS.	Number of Districts.	Number of Public Vaccinators in each Union.	Infants vaccinated in each Union.	Infant Vaccinations per 100 of registered Births.	Older Vaccinations per 100 of Children vaccinated.	Found unvaccinated in public Schools per 100 of Children examined.	Estimated Value of the Vaccination in Unions: Perfection being taken at 1000.
Rotherham	8	8	2,391	45·8	19·2	11·6	212
Saddleworth	3	1	487	25·0	2·4	11·4	237
Sedbergh	2	1	372	88·9	1·8	2·0	331
Selby	5	4	752	46·8	21·9	10·6	279
Settle	7	4	492	42·4	20·9	13·7	223
Sheffield	7	7	6,404	40·1	17·6	13·9	220
Skipton	8	6	1,863	44·6	27·0	9·7	234
Tadcaster	2	2	*	*	*	13·2	203
Thorne	6	6	1,293	77·0	13·1	12·6	199
Wakefield	13	13	4,091	69·8	7·5	8·5	253
Wetherby	5	5	*	*	*	12·9	241
Wharfedale†	3	3	394	53·4	22·8	10·8	267
Wortley	3	3	1,280	44·3	15·4	8·0	251
Ashton-under-Lyne	12	12	7,759	51·5	6·7	10·3	231
Barton-upon-Irwell	4	4	1,967	49·2	10·8	10·3	169
Blackburn	9	9	7,381	49·3	6·7	9·1	233
Bolton	10	10	9,407	56·2	8·1	8·2	214
Burnley	7	7	3,451	40·2	10·5	8·0	135
Bury	6	4	4,738	43·3	10·7	7·2	206
Caton Incorporation	4	3	411	43·8	27·1	6·8	313
Chorley	5	5	3,363	73·0	11·0	7·6	159
Chorlton-upon-Medlock	9	9	8,636	55·4	5·2	8·9	173
Clitheroe	5	4	1,125	57·8	22·6	7·9	199
Fylde, The	6	9	2,102	52·1	7·4	7·7	227
Garstang	3	3	740	60·0	13·2	8·7	199
Haslingden	6	6	4,697	50·6	6·6	7·6	229
Lancaster	8	8	884	38·1	18·1	6·9	209
Leigh	7	7	3,394	53·3	27·3	15·2	198
Liverpool	12	12	14,791	52·5	9·3	10·5	197
Manchester	5	5	13,640	63·3	6·4	10·2	180
Oldham	9	12	8,450	64·4	6·3	6·7	195
Ormskirk	5	5	2,345	49·1	16·5	11·2	235
Prescot	3	7	5,083	53·9	7·4	12·6	174
Preston	7	7	7,556	57·3	8·6	12·0	244
Prestwich	3	3	2,262	36·8	26·7	12·0	215
Rochdale	7	7	5,200	53·1	5·5	9·8	187
Salford	3	3	6,959	56·2	2·9	10·3	202
Todmorden	5	5	788	39·8	27·4	7·1	236
Toxteth Park	2	2	2,231	34·6	6·6	6·9	213
Ulverstone	6	6	2,368	67·7	3·5	6·4	231
Warrington	6	4	3,146	56·5	12·6	11·5	168
West Derby	13	13	5,170	30·6	7·0	8·7	209
Wigan	8	8	8,583	68·6	7·6	12·4	223
Altrincham	6	7	1,981	50·4	11·8	11·3	261
Birkenhead	4	4	1,503‡	38·3	12·4	12·7	196
Boughton, Great	3	3	816	32·1	34·5	14·5	179
Chester§	1	1	1,291	44·8	15·3	19·4	174
Congleton	4	4	2,271	63·8	18·4	12·1	205
Macclesfield	4	4	3,327	55·2	27·0	9·4	276
Nantwich	8	8	3,306	73·5	7·4	7·7	194
Northwich	7	7	3,175	81·2	4·6	7·3	231
Runcorn	4	4	2,196	72·2	13·1	11·6	176
Stockport	5	5	5,445	54·7	8·5	10·3	200
Wirral	4	4	422‖	60·4	4·9	10·5	202
Cockermouth	5	5	1,249	28·2	26·3	14·7	194

* New union. No return.
† For 1½ years only.
‡ For 1½ years only.
§ Not divided into districts.
‖ For 1 year only.

From the above table it will be seen that the highest amoun of infant vaccination had been done in Sedbergh union, in th West Riding of Yorkshire, in which the per-centage of infan vaccination to registered births was 88·9. The lowest rate wa found in Ripon, also in the West Riding of Yorkshire, where i was only 21·5. The average per-centage of infant vaccinations o

registered births in the 32 unions in the West Riding from which returns had been made* was 55·1. The average per-centage of infant vaccinations in the 30 unions in Lancashire was 52·3. And the same calculation for the 11 unions in Cheshire give an average of 58·7 per cent.

In Table B. will be found a list of certain districts in which great disparity was found between the amounts of infant vaccination and of the vaccination of older children, as evidenced by the examination of children at the public schools; and to economise space the difference in quality is shown in the same table.

TABLE B.—In which is made a Comparison between the Vaccination of Infants and of older Children as to Quantity and Quality, based upon the Examinations at Public Schools in certain Districts.

UNIONS.	DISTRICTS.	Well vaccinated.		Not vaccinated.	
		Infants.	Older.	Infants.	Older.
hefield	Attercliffe	15·8	8·0	13·8	11·2
otherham	Rotherham	75·9	14·8	34·9	15·9
	Kimberworth	41·8	26·3	6·2	7·7
	Swinton	19·5	24·2	7·1	6·0
ool e	Goole	6·4	10·4	24·6	16·6
adcaster	Aberford	3·3	11·1	3·3	7·4
	Tadcaster	12·5	9·3	16·6	20·5
naresboro'	Ripley	42·1	12·5	5·2	4·1
	Harrogate	12·1	26·3	13·1	7·9
useburn, Great	Boroughbridge	2·3	6·7	9·3	7·6
	Great Ouseburn	8·1	11·8	12·5	9·7
ipon	Ripon	2·5	7·1	20·2	12·6
rlton Incorporation	Otley	2·0	11·4	16·0	10·3
	Headingley	21·5	12·6	33·7	10·8
unslet Township	East	16·2	23·7	16·2	11·6
eeds Township	North-east	4·1	11·3	13·9	13·2
Wakefield	Flockton	12·9	22·8	14·0	1·9
	Wakefield	37·4	22·3	10·3	7·4
Fortley	Bradfield	32·2	18·1	6·2	10·3
	Ecclesfield	55·7	15·7	9·3	5·4
Huddersfield	Kirk Burton	78·2	49·5	6·0	5·7
	Slaithwaite	11·4	26·5	1·6	6·8
	Huddersfield, N.	6·4	18·3	8·2	7·7
Saddleworth	Delph	6·6	10·7	12·3	12·9
Lancaster	South	1·6	5·6	8·2	2·2
The Fylde	Lytham	11·2	3·3	15·3	6·0
	Fleetwood	6·8	23·6	9·6	9·5
Preston	No. 2.	15·4	23·0	13·8	11·7
Ormskirk	Ormskirk	11·1	31·3	13·0	10·9
West Derby	Great Crosby	18·5	9·3	6·1	13·6
	Garston	5·7	16·6	12·3	3·3
Liverpool, Parish	No. 7.	8·6	6·2	17·3	4·3
Prescott	Sutton	0·0	4·9	10·0	11·3
	Farnworth	1·3	2·3	20·0	17·8
	Wooiton	3·2	14·0	18·0	9·3
Leigh	Leigh	2·7	6·1	22·2	11·3
	Tyldesley	3·3	5·8	17·8	16·1
Warrington	Warrington	0·6	1·7	14·6	11·7
Bolton	*Sharples*	17·2	27·1	8·2	5·5
Chorley	*Brindle*	0·0	0·0	13·7	10·8
Clitheroe	Clitheroe	1·1	6·5	10·4	8·5
Burnley	Burnley	0·0	7·9	8·3	8·5
Rochdale	Spotland	12·3	3·6	4·1	4·5
	Wardleworth	15·5	1·0	15·3	11·1
	Butterworth	1·7	3·9	5·1	15·1
Haslingden	Rossendale	43·3	17·9	5·0	6·3
Bury	Radcliffe	4·1	13·3	12·5	3·0
Birkenhead	Claughton	5·3	11·2	14·8	9·3
Boughton, Great	Great Boughton	14·2	24·1	23·0	10·0
Wirral	Neston	1·1	10·6	8·2	4·0
Chester	Whole Union	18·1	17·0	32·3	15·3
Macclesfield	Bollington	49·4	26·1	12·9	9·7
	Macclesfield	18·0	25·0	3·5	11·2
Stockport	Marples	1·4	1·1	20·2	17·9
Altrincham	Ashton-in-Mersey	22·9	6·4	1·6	12·3
Northwich	Winsford	50·0	28·5	2·1	3·8
Runcorn	Runcorn	2·5	7·8	17·5	5·0

*Returns for the three years had not been received from Tadcaster, Wetherby, Bramley, Holbeck, and Pontefract, as they had only recently been formed into unions.

In scanning the columns of the preceding table some startling revelations will appear. The Kirk Burton district of the Huddersfield union shows 78·2 per cent. well vaccinated of the infants examined, and none unvaccinated. This gives great hope for the future; but we must not lose sight of the fact, that the older children, who are probably beyond the reach of further vaccination, are well vaccinated to only two thirds of the extent of the younger, and nearly six per cent. were found quite unprotected. In the great majority of instances, however, this table reveals a much more melancholy state of things, a far worse quality and an aggravated falling off in quantity among the later vaccinations showing that, bad as had been the older system adopted, this was becoming year by year more worthless.

As in some unions there was found an increasing desire to make public vaccination as complete as possible, and as in others there existed a shameful neglect of, if not an actual resistance to, the proper provision to the public of this protection, while in other unions langour and apathy were constantly evinced, it is only fair to place the unions visited side by side in a table (Table C.), with a view to show the condition of each according to the activity, lukewarmness, or negligence of their respective authorities or officers.

TABLE C.—Showing the Unions in which the Quantity of Public Vaccination of Infants was either

Increasing.	*	Stationary.	*	Diminishing.	*
Barnsley	203	Bradford	252	Bierley, North	322
Halifax	241	Dewsbury	231	Doncaster	191
Huddersfield	289	Ecclesall Bierlow	231	Goole	186
Keighley	168	Preston, Great (Incorporation)	285	Hemsworth	187
Leeds	192	Sheffield	220	Hunslet	238
Ouseburn, Great	255	Thorne	199	Knaresboro'	227
Sedbergh	331	Wakefield	283	Pateley Bridge	316
Selby	279	Altrincham	261	Penistone	230
Skipton	234	Birkenhead	196	Ripon	190
Blackburn	233	Boughton, Great	179	Rotherham	212
Burnley	195	Congleton	203	Saddleworth	227
Bury	266	Nantwich	194	Settle	228
Caton (Incorporation)	313	Stockport	200	Wortley	201
Garstang	190	Wirral	202	Chester	174
Haslingden	229	Bolton	214	Macclesfield	276
Lancaster	299	The Fylde	237	Newhwich	224
Manchester	180	Leigh	168	Runcorn	176
		Preston	244	Chorley	159
		Rochdale	187	Clitheroe	190
		Toxteth Park	215	Liverpool	197
		Ulverstone	231	Ormskirk	235
		West Derby	209	Prescot	174
		Cockermouth	194	Todmorden	226
		Oldham	195	Warrington	168
		Salford	202	Wigan	223
				Ashton-under-Lyne	231
				Barton-upon-Irwell	166
				Prestwich	215
				Chorlton-upon-Medlock	178

Wharfedale, a new Union; no returns.
Wetherby, Do. Do.
Tadcaster Do. Do.
Pontefract, Do. Do.
Holbeck, Do. Do.
Barwick (Incorporation); no reliable returns.
Bramley, a new Union; no returns.
Carlton (Incorporation); no reliable returns.

* Number *indicating* value of the vaccination as respects quantity and quality.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3 In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

In some districts very glaring neglect was evinced, and those districts have been placed together in Table D.

TABLE D.—Showing certain much neglected Districts.

Unions.	Districts.	Population in 1861.	Infant Vaccinations, per 100 of Population, for Three Years.	Births, per 100 of Population, for Three Years.
Bierley, North	Cleckheaton	7,430	3·0	11·5
Bradford	Manningham	12,890	1·6	11·2
Dewsbury	Dewsbury	18,148	3·3	12·8
Doncaster	Houghton Pagnal	1,762	2·9	10·3
Halifax	Sowerby	7,746	0·5	10·7*
"	Halifax	23,891	2·2	10·7
Huddersfield	Almondbury	8,326	3·5	11·1
Ripon	No. 1	8 023	0·5	9·5†
Rotherham	Rotherham	13,094	2·8	12·2
Settle	Long Preston	1,358	0·0	9·1
"	Settle	4,609	1·5	9·3
Skipton	Barnoldswick	5,528	2·0	9·3‡
"	Addingham	2,330	2·4	9·8
Burnley	Colne	8,890	1·6	11·3
Bury	Bury	36,399	2·0	10·8
Prescot	Hayton	4,056	2·1	12·5
Todmorden	Todmorden	11,428	1·3	9·8
Warrington	No. 3.	5,356	1·9	12·7
Cockermouth	Keswick	5,723	1·1	9·0
Keighley	Bingley	12,204	1·6	6·3§
Selby	Drax	4,824	1·0	10·3
Altrincham	Tabley	5,869	2·7	9·6
Bolton	West Houghton	6,973	2·4	12·4
Ormskirk	North Meols	17,048	2·0	10·3
West Derby	West Derby (Rural)	10,971	2·5	15·9

* None in 1861.
† In 1861 no infant vaccinations were done.
‡ In 1862 the infant vaccinations were 0·5 per cent. of population.
§ For two years only.

Thus far the quantity of infant vaccination done in unions has been dealt with. It would be very desirable to have made a similar comparison, based upon the public returns, of the relative amount of vaccination done in the different districts. In many cases the short coming of one district of a union affects its rate of infant vaccination so greatly as to place it far lower in the list than an estimate formed from a consideration of the several remaining districts would have justified. However, it is found impossible to come to any accurate conclusion as to the quantity of vaccination done in districts, inasmuch as the births in many of them cannot be ascertained with sufficient precision. In the majority of the annual returns to the Poor Law Board the births in the vaccination districts are not returned by clerks to guardians, and in some cases (unless great pains were bestowed on the work) such a return could not be made from the fact that two vaccination districts divide a parish or township, and as the sub-district registrars return the births for townships or parishes only, they could not say what proportion of the births in a given township belonged to either one, two, or more vaccination districts which might divide it.

As far as I have been able, I have added to the Table (F.), which sets forth the quantity of the vaccination as deduced from school examinations, all the information I could gather as to the relative amount of infant vaccination recorded in the public returns (for the three years before referred to) in vaccination districts.

In Table (E.) will be found the results of the examination of 4,057 children in the workhouses of the unions visited. It will be seen that in some vaccination had been much neglected, owing chiefly to the

causes mentioned in my report for 1862, the migratory nature of the workhouse population, and the nonpayment, per case, of the workhouse medical officer for vaccination done in the workhouse. Those unions which include the payment for vaccination in the salary of the workhouse medical officer are in the following table indicated by an (S)

TABLE E.—Workhouses.

Unions.	Estimated Value of Quantity and Quality of Vaccination, Perfection being 1,000.	No. of Children examined.	Per cent. *well* vaccinated.	Per cent. *indifferently* vaccinated.	Per cent. *badly* vaccinated.	Per cent. *un*-vaccinated.	Per cent. marked by Small-pox.
Ecclesall Bierlow	196	94	14·8	46·8	21·2	17·0	4·2
Sheffield (S)	230	229	21·8	40·6	31·3	18·1	5·6
Rotherham	159	33	7·8	39·4	34·2	18·4	2·6
Doncaster (S)	189	98	12·0	48·2	17·2	22·4	5·1
Thorne	139	39	2·5	43·5	28·2	25·6	5·1
Goole	210	28	7·1	60·7	10·7	21·4	3·5
Hemsworth	180	8	0·0	62·5	37·5	0·0	0·0
Great Preston (Incorporation	205	22	18·1	40·9	22·7	18·1	0·0
Selby (S)	247	23	17·3	39·1	13·0	30·4	0·0
Tadcaster*	..	..	..	..	..	..	..
Wetherby*	..	..	..	..	..	..	..
Knaresborough†	..	..	..	..	..	..	..
Great Ouseburn‡	..	..	..	..	..	..	..
Ripon	224	23	8·6	65·2	26·0	0·0	0·0
Pateley Bridge†	..	..	..	..	..	..	..
Wharfedale*	..	..	..	..	..	..	..
Carlton	185	6	0·0	66·6	33·3	0·0	0·0
Bramley	270	7	0·0	100·0	0·0	0·0	0·0
Barwick †	..	..	..	..	..	..	..
Hunslet	261	17	35·2	58·8	0·0	5·8	0·0
Holbeck	157	16	6·2	43·7	18·7	31·2	6·2
Leeds	160	31	9·6	38·7	19·3	32·2	3·2
Pontefract*	..	..	..	..	..	..	..
Wakefield	195	34	17·6	26·4	35·2	20·5	5·8
Dewsbury	228	42	16·5	21·4	23·8	38·0	11·9
Barnsley	306	78	28·2	30·7	30·7	10·2	3·8
Penistone	216	37	13·5	35·1	35·1	16·2	2·7
Wortley	252	37	21·6	51·3	16·2	10·8	2·7
Huddersfield	286	59	15·6	49·1	18·6	15·5	10·1
Saddleworth	270	3	0·0	100·0	0·0	0·0	0·0
Halifax	204	72	8·3	62·5	20·8	8·3	0·0
North Bierley	205	19	5·2	42·1	47·3	5·2	0·0
Bradford (S)	220	25	17·5	40·3	25·3	8·0	1·2
Keighley	133	9	0·0	55·5	22·2	22·2	11·1
Skipton	393	18	33·3	50·0	0·0	16·6	11·1
Settle	151	14	7·1	50·0	14·2	28·5	0·0
Sedbergh	385	11	27·2	63·6	9·0	0·0	0·0
Cockermouth	252	101	13·8	53·4	20·7	6·9	2·9
Blackburn	186	82	6·0	56·0	20·7	17·0	2·4
Ulverstone	190	76	14·4	44·7	25·0	15·7	2·6
Caton (Incorporation)	..	..	..	..	..	..	..
Lancaster	354	25	32·0	40·0	24·0	4·0	0·0
Garstang §	..	..	..	..	..	..	..
The Fylde	318	38	21·4	57·1	17·8	3·5	0·0
Preston	263	114	24·5	50·0	18·4	7·0	0·0
Ormskirk	223	44	9·0	56·8	22·7	11·3	2·2
Wigan	157	107	4·6	34·5	28·0	32·7	5·6
West Derby	210	172	22·2	58·2	17·4	12·2	2·3
Toxteth Park	215	113	15·5	44·2	28·3	9·8	0·0
Liverpool	166	66	9·0	45·4	36·3	9·0	1·5
Prescot	199	62	8·0	51·6	30·6	9·6	1·6
Leigh	155	70	4·2	51·4	20·0	24·2	5·7
Warrington	153	132	1·5	55·3	25·7	17·4	0·7
Bolton	180	107	16·8	28·9	30·4	12·7	0·0
Chorley	154	25	8·0	40·0	36·0	36·0	8·0
Clitheroe ‖	..	..	..	..	..	..	..
Burnley	134	24	0·0	54·1	29·1	16·6	0·0

* New unions; no workhouse.
† Workhouse children in National Schools.
‡ Workhouse children were out for a walk at time of visit.
§ No children in the workhouse.
‖ Only two children, and they indifferently vaccinated.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

TABLE E.—*continued.*

Unions.	Estimated Value of Quantity and Quality of Vaccination, Perfection being 1,000.	No. of Children examined.	Per cent. *well* vaccinated.	Per cent. *indifferently* vaccinated.	Per cent. *badly* vaccinated.	Per cent. *un*-vaccinated.	Per cent. marked by Small-pox.
Todmorden*	...	...	...	...	8·6	26·0	0·0
Rochdale	154	23	0·0	65·2	30·0	0·0	0·0
Haslingden	172	6	0·0	50·0	32·0	21·0	1·1
Bury	157	85	5·8	40·0	23·3	16·6	3·8
Oldham	161	90	4·4	55·6	41·3	14·6	0·0
Ashton-under-Lyne	167	75	0·0	44·0	10·0	30·6	0·0
Barton-on-Irwell	147	10	10·0	50·0	44·4	0·0	0·0
Prestwich	173	9	11·1	44·4	...	...	...
Chorlton-on-Medlock (S)	143	138	3·7	44·1	45·2	6·9	2·6
Manchester	202	177	16·3	38·4	27·1	18·0	3·3
Salford	162	182	9·3	29·1	41·7	19·7	3·2
Birkenhead	162	76	2·6	52·6	18·4	26·3	1·3
Great Boughton	114	56	0·0	26·7	51·7	21·4	1·7
Wirral†	...	...	...	...	...	...	...
Chester (S)	166	93	15·6	25·0	23·8	35·4	15·6
Nantwich	137	48	0·0	39·6	43·7	16·6	0·0
Congleton (S)	180	60	8·3	51·6	15·0	25·0	0·0
Macclesfield	273	127	18·8	42·5	29·1	9·4	1·3
Stockport	174	133	10·5	40·6	34·5	14·2	1·5
Altrincham	190	97	9·2	47·4	29·8	13·4	0·0
Northwich	262	62	22·5	58·0	17·7	1·6	0·0
Runcorn	119	62	0·0	40·3	37·0	22·5	4·8

*No workhouse in the union.
† All the children, save two, belonged to Birkenhead Union.

In dismissing the subject of the quantity of vaccination performed in the unions and districts visited, it must be recorded that the public returns in some instances showed unreasonably large amounts of infant vaccination; and owing to the same causes as those referred to in my last report. In some cases vaccination done in any part of a union had been returned as work in one vaccination district only. Occasionally vaccination beyond the border of a union had been returned and paid for improperly: thus falsifying public returns, and causing great ill-feeling on the part of boards of guardians and between public vaccinators in contiguous districts of adjacent unions.

II.—QUALITY OF THE VACCINATION.

The following Table (F.) gives the result of the examination by me of 85,355 children at 924 public schools in 436 vaccination districts. A careful consideration of that table will afford very accurate information of the quality of the vaccination in each locality specified, always with the reservation before made.

I have adopted the same course as I pursued in my report last year. I have set down those as "well vaccinated," who showed four or three typical vaccine cicatrices. Those who had two or one similar marks I have considered "indifferently vaccinated," and those with any number of bad marks I have esteemed "badly vaccinated."

The cicatrices which I have stigmatised as bad had none of the characteristic appearances known to result from the true Jennerian vesicle; and I have excluded from this category all those that had faint characteristics. In short, I have in all instances made the best of the observed evidences of vaccination.

I have added this year to this table of quality another column, in which I have inserted against each vaccination district a number indicative of the estimated value of the quantity and quality combined of the vaccination of the district. I have taken 1,000 as the standard of perfect vaccination or greatest amount of protection attainable by vaccination against death by small-pox. To arrive at the distinctive number for each district, I have multiplied the number of children found to possess the different amounts of evidence of vaccination by multipliers varying according to the risk of death by small-pox accruing to each class. These multipliers are varied for each class (according to number or value of cicatrices) in conformity with the results, or amount of risk attributed to each, embodied in a table furnished to the Lords of Her Majesty's Privy Council by Mr. Marson.

I believe the scheme upon which this additional column has been framed is very accurate; but if its results be only partially correct as a positive valuation of the state of protection of a given district, it affords very valuable relative information; for whereas analogous data have been used in the case of each district, and identical treatment or mode of calculation has been given to all, it is found that one district, the North Bierley east district of the North Bierley union, figures at 730, the nearest approach to perfection observed, while another, the Kildwick district of the Skipton union, numbers only 111.

TABLE F.—*Showing the Result of School Examinations in all the Districts visited, and the Per-centage of Infant Vaccinations (calculated from the Annual Returns for Three Years ended 30th September 1862) in some Districts for which Materials for the Calculation could be obtained.*

Union.	District.	Number of Children examined.	Per cent. well vaccinated.	Per cent. indifferently vaccinated.	Per cent. doubly vaccinated.	Per cent. not vaccinated.	Per cent. marked by Small-pox.	Infants vaccinated (per cent. of Births from Returns).	Estimated Value of Vaccination, Per-centage being 1,000.
Ecclesall Bierlow -	Ecclesall Bierlow, S. - -	156	30·5	41·6	23·0	14·7	0·0	..	227
	Ecclesall Bierlow, N.W. -	139	23·7	32·3	28·0	15·8	1·4	..	208
	Hallams - - -	159	25·8	37·3	20·0	9·3	2·6	..	238
	Norton, &c. - - -	51	31·3	31·3	31·3	5·8	0·0	..	256
Sheffield - -	Sheffield, N. - - -	185	16·2	45·9	23·7	14·0	3·7	..	210
	Sheffield, N.W. - -	72	20·8	51·3	15·2	12·5	0·0	..	245
	Sheffield, S. - - -	94	20·2	40·4	27·6	11·7	0·0	..	219
	Sheffield, S.E. - - -	185	22·2	30·3	32·5	14·8	1·4	..	210
	" Infants - -	79	20·2	18·9	43·0	17·7	0·0	..	196
	Brightside - - -	92	20·6	36·9	29·3	13·0	5·4	..	226
	" Infants - -	93	21·5	47·3	20·4	10·7	1·0	..	245
	Attercliffe - - -	63	8·0	53·2	27·4	11·2	0·0	..	209
	" Infants - -	101	15·8	48·5	21·7	13·8	0·0	..	218
Rotherham - -	Rotherham - - -	320	16·8	35·6	33·4	15·0	6·3	2·8*	192
	" Infants - -	44	15·9	31·8	18·1	34·0	2·2	..	176
	Kimberworth - - -	187	26·3	46·1	19·7	7·7	1·7	18·9*	250
	" Infants - -	48	41·6	39·5	12·5	6·2	0·0	..	317
	Wentworth - - -	72	8·0	63·8	23·6	5·5	1·3	6·4*	209
	Swinton - - -	99	23·2	41·4	28·2	6·0	2·0	7·3*	254
	" Infants - -	55	19·6	48·2	25·0	7·1	0·0	..	257
	Wath - - -	120	7·5	55·8	29·1	7·5	2·5	16·6*	197
	Laughton - - -	64	1·5	70·3	15·6	12·5	0·0	6·6*	183
	Maltby - - -	53	3·7	56·9	36·1	15·0	1·8	6·3*	170
Doncaster - -	Askerne - - -	45	2·2	73·3	15·5	8·8	0·0	..	199
	Bawtry - - -	68	11·7	30·0	27·9	30·2	0·4	..	220
	Conisborough - - -	51	5·8	66·6	17·6	9·8	1·9	..	195
	" Infants - -	69	5·7	69·5	15·9	8·6	2·9	..	210
	Doncaster, W. - - -	87	6·8	58·6	19·5	14·9	3·4	..	188
	" Infants - -	87	5·7	62·0	18·3	13·6	0·0	..	181
	Mexborough - - -	66	10·7	44·6	32·3	12·8	0·0	..	173
	Tickhill, Infants - -	97	0·0	73·5	17·2	9·1	0·0	..	175

* Per 100 of population. The births in the union during the three years being at the rate of 15·2 per 100 of population.

TABLE F.—*continued.*

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

, in Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

Union.	District.	Number of Children examined.	Per cent. well vaccinated.	Per cent. indifferently vaccinated.	Per cent. badly vaccinated.	Per cent. not vaccinated.	Per cent. Insusceptible by Small-pox.	Infants vaccinated (per cent. of Births (from Returns)).	Estimated Value of Vaccination. Per Section (vide Appx.
Thorne	Belton	21	19·0	42·8	19·0	19·0	0·0	81·0	211
	Epworth	171	14·6	48·5	25·1	11·6	0·0		209
	Crowle	95	2·1	68·4	16·8	12·6	0·0	80·0	179
	Hatfield and Stainforth	102	19·6	43·1	24·5	12·7	0·0		250
	Thorne	118	2·5	72·7	16·9	6·7	0·0	73·0	210
Goole	Goole	259	10·4	50·1	22·7	16·6	0·7	43·2	188
	" Infants	77	6·4	48·0	20·7	24·6	0·0		154
	Reedness	18	5·5	72·2	22·2	0·0	0·0		204
	Swinefleet	48	0·0	75·0	12·5	12·5	2·0	65·1	177
	Snaith	112	4·4	71·4	15·1	8·9	0·0	57·0	188
Hemsworth	Hemsworth	33	0·0	75·7	18·1	6·0	0·0	..	173
	Ackworth	34	14·7	50·0	29·4	5·8	0·0	..	213
	South Kirkby	8	0·0	50·0	25·0	25·0	0·0	..	150
Great Preston Incorporation.	Altofts	20	10·0	75·0	5·0	10·0	0·0	..	225
	Brotherton	65	62·2	17·7	11·1	8·8	2·2	..	647
	Castleford	79	22·7	41·7	21·5	13·9	0·0	..	287
	Beaghall	24	16·6	50·0	20·8	12·5	4·1	..	229
	Methley	58	5·1	68·9	22·4	3·4	0·0	..	212
	Sherburn	39	16·8	52·8	24·8	5·6	0·0	..	276
Selby	Kippax	109	6·4	76·1	9·1	8·2	0·0	..	240
	Cawood	87	24·1	57·4	17·2	1·1	1·1	..	278
	Riccall	60	11·6	55·0	16·6	16·6	1·6	..	193
	Carlton	36	14·2	57·1	17·1	11·3	0·0	..	228
	" Infants	27	11·1	62·9	14·8	11·1	0·0	..	208
	Selby	61	40·9	34·4	11·4	13·1	1·6	..	455
	" Infants	44	27·2	61·3	4·5	6·8	2·2	..	320
Tadcaster	Aberford	54	11·1	59·0	31·4	7·4	1·8	..	215
	" Infants	30	3·3	66·6	26·6	3·3	0·0	..	194
	Tadcaster	73	9·5	54·7	15·0	20·5	4·1	..	188
	" Infants	24	12·5	54·1	16·6	16·6	0·0	..	210
Wetherby	Wetherby	116	10·3	61·2	16·3	12·0	4·3	..	228
	Kirby Overblows	44	11·3	68·1	15·9	4·5	0·0	..	271
	East Keswick	47	6·3	59·5	17·0	17·0	0·0	..	218
	Bardsey	33	9·3	46·5	18·6	25·5	0·0	..	176
	Wighill	35	20·0	71·4	2·8	5·7	2·8	..	312
Knaresborough	Scriven	12	0·0	66·6	16·6	16·6	0·0	52·6	194
	Ripley, Older	24	12·5	41·6	41·6	4·1	0·0	..	185
	" Infants	19	42·1	21·0	31·5	5·2	0·0	62·8	268
	Harrogate	171	28·3	40·9	25·7	7·0	0·0	58·4	304
	" Infants	99	12·1	33·5	21·2	13·1	0·0	..	217
	Knaresborough	265	6·4	60·7	13·2	19·6	2·2	24·6	198
Great Ouseburn	Acomb	78	16·6	57·6	16·6	8·9	0·0	64·9	223
	Aldborough, Infants	76	7·8	75·0	7·8	9·2	0·0	33·9	228
	Boroughbridge	104	6·7	65·3	20·1	7·6	0·0	54·0	215
	" Infants	43	2·3	60·4	27·9	9·3	2·3	..	191
	Hammerton	49	36·7	38·7	14·4	10·2	0·0	62·2	429
	Helperby	83	31·3	46·9	12·0	9·6	0·0	73·0	391
	Great Ouseburn	69	11·8	65·1	15·2	6·7	0·0	95·2	278
	" Infants	32	3·1	65·6	18·7	12·5	0·0	..	179
	Tollerton	76	5·2	71·0	12·7	3·9	0·0	98·1	250
Ripon	Dishforth	39	22·8	51·2	15·3	10·2	0·0	33·1	270
	Wath	76	6·5	63·1	21·0	9·2	0·0	42·0	189
	Kirby Malzeard	61	1·6	49·1	42·6	6·5	0·0	55·0	154
	Ripon	16	0·0	56·2	31·2	12·5	0·0	..	156
	" Infants	237	7·1	62·0	18·1	12·6	0·8	5·2	191
Pateley Bridge	Easterc	79	2·5	56·9	20·2	20·2	3·7	..	160
	Southern	65	13·8	52·3	23·0	10·7	0·0	..	271
	Central	151	13·6	59·0	15·8	11·3	0·0	..	253
Wharfedale	Yeadon	216	9·7	64·3	17·1	7·9	1·3	..	326
	Horsforth	226	30·9	44·2	12·8	11·5	1·7	..	230
	Fewston	47	10·5	61·4	14·0	14·0	0·0	..	181
Carlton Incorporation.	Baildon	142	7·7	68·3	15·4	8·4	0·7	..	190
	" Infants	47	8·5	63·8	17·0	10·6	0·0	..	216
	Weeton	28	8·6	56·5	21·7	13·0	0·0	..	248
	Rawden	87	40·4	35·6	10·3	4·5	0·0	..	225
	Otley	87	11·4	60·6	11·4	10·3	2·2	..	238
	" Infants	50	2·0	72·0	10·0	16·0	0·0	..	242
	Burley	97	8·2	59·7	16·3	15·4	0·9	..	187
	Ilkley	67	0·0	64·1	14·9	20·8	0·0	..	194
	Armley	172	20·9	50·0	15·1	13·9	0·5	..	153
	Wortley	61	14·7	54·0	21·3	9·8	0·0	..	282
	" Infants	61	14·7	45·9	19·6	19·6	0·0	..	221
	Churwell	59	6·7	64·4	20·3	8·4	3·3	..	202
									233

TABLE F.—*continued.*

Union.	District.	Number of Children examined.	Per cent. *well* vaccinated.	Per cent. *indifferently* vaccinated.	Per cent. *badly* vaccinated.	Per cent. *not* vaccinated.	Per cent. marked by Small-pox.	Infants Vaccinated per cent. of Births (from Returns).	Estimated Value of Vaccination, Per-fection being 1,000.
	Beeston	104	26·9	54·8	12·5	5·7	0·0	..	264
	Headingley	111	12·6	66·7	1·9	13·7	1·9	..	248
	" Infants	51	21·5	62·7	2·0	13·7	0·0	..	232
	Chapel Allerton	93	10·7	60·2	23·6	5·3	0·0	..	226
	Castleton	59	10·1	57·6	23·7	8·4	1·6	..	203
	Rothwell	85	4·7	71·7	16·4	7·0	0·0	..	217
	Eccleshill	101	8·9	69·3	17·8	10·8	0·0	..	
Bramley	Bramley	179	6·7	60·8	16·2	16·2	1·1	..	209
	Gildersome	131	6·1	38·1	22·9	32·9	2·2	..	140
Barwick Incorporation.	Barwick	62	12·9	48·3	24·1	14·5	0·0	..	212
	Normanton	19	26·3	15·7	52·6	5·2	0·0	..	299
	Scacroft	63	14·2	30·6	38·0	7·9	0·0	..	223
Hunslet	North	209	20·5	49·2	17·2	12·9	1·9	..	251
	" Infants	213	8·4	63·8	16·4	11·2	0·0	..	206
	East	223	23·7	52·4	12·1	11·6	0·4	..	244
	" Infants	209	16·2	51·6	15·7	16·2	0·4	..	214
	West	41	46·3	34·1	4·8	14·6	0·0	..	378
Holbeck	East	659	25·0	40·2	22·1	12·5	3·0	..	238
	" Infants	231	22·9	44·5	19·4	12·9	1·2	..	224
	West	178	41·0	31·4	20·7	6·7	0·0	..	288
	" Infants	162	59·8	25·4	8·8	5·8	0·6	..	325
Leeds	N. and N.W.	337	8·0	54·0	25·5	12·4	1·4	..	200
	" Infants	188	5·8	52·6	29·2	13·2	0·0	..	186
	W. and S.	112	10·7	62·5	15·1	11·6	0·8	..	221
	" Infants	53	7·6	55·7	23·6	13·4	0·0	..	186
	N.E.	181	11·6	40·8	34·2	13·2	3·3	..	188
	" Infants	43	4·1	51·1	30·2	15·9	0·0	..	176
	E.	235	9·7	59·7	21·7	9·7	3·4	..	217
	" Infants	93	16·1	51·6	22·5	9·6	0·0	..	243
Pontefract	Knottingley	43	6·9	53·4	25·5	13·9	0·0	..	213
	Whitley	125	5·6	64·0	16·8	13·6	0·0	..	188
	Pontefract	46	13·0	60·8	6·5	19·5	0·0	..	220
	" Infants	66	46·9	25·7	21·2	6·6	1·5	..	452
	Monk Fryston	35	48·5	40·0	2·8	8·5	0·0	..	523
	" Infants	235	46·5	30·1	14·7	8·4	1·7	..	418
Wakefield	Alverthorpe, Horbury, &c.	44	40·9	25·0	20·4	13·6	0·0	..	340
	Ardsley, E.	87	10·3	58·6	18·3	12·6	2·2	..	222
	Ardsley, W.	126	27·7	40·4	28·5	3·1	0·0	..	320
	Bretton and Crigglestone	62	28·8	44·2	25·0	1·9	3·8	..	389
	Flockton	50	12·0	64·0	20·0	14·0	2·0	..	237
	" Infants	49	12·2	63·2	12·2	12·2	0·0	..	252
	Lofthouse	248	36·6	39·5	16·1	7·6	0·0	..	365
	Sandal Magna, &c. &c.	26	7·6	34·6	46·1	11·5	0·0	..	163
	Shitlington	656	28·3	41·4	22·7	7·4	1·5	..	292
	Wakefield	270	37·4	37·4	14·8	10·3	0·3	..	289
	" Infants	132	7·5	54·5	23·4	14·3	3·0	31·1	196
Dewsbury	Batley	128	1·5	44·5	32·8	21·0	4·6	24·5	148
	Dewsbury	151	31·1	37·7	19·8	11·2	1·9	74·4	261
	Birstall	131	8·3	62·5	16·7	12·2	0·7		329
	Gomersall	168	20·2	44·0	19·0	16·6	0·8	65·1	282
	Heckmondwicke	121	15·7	61·1	17·3	5·7	0·0		274
	Liversedge	105	4·7	63·8	20·9	10·4	0·0	45·7	203
	Mirfield	146	11·6	50·6	24·6	13·0	1·3	56·9	246
	Morley	216	17·1	42·1	32·4	8·2	0·4	84·4	240
	Ossett	193	19·4	51·4	20·3	8·7	0·9	..	276
	" Infants	105	5·7	44·7	37·1	12·3	0·0	48·4	174
	Scothill	89	12·3	50·5	33·7	3·3	0·0	57·5	250
	Whitley (Lower), &c.	73	2·7	71·2	16·4	9·5	0·0		181
Barnsley	Barnsley, E.	70	5·7	64·2	21·4	8·5	0·0	61·8	182
	" Infants	269	6·7	57·6	26·8	8·9	1·4	48·5	186
	Barnsley, W.	130	7·6	56·9	24·6	10·7	0·0	—	190
	" Infants	42	9·5	47·6	40·4	2·3	2·3	51·6	194
	Darton	185	8·0	56·2	22·7	12·9	1·6	72·4	212
	Wombwell	66	15·1	46·9	31·8	6·0	1·5	54·3	253
	Wooley	42	14·2	42·8	35·9	7·1	0·0	53·1	247
Penistone	Denby	159	13·8	48·4	27·6	10·0	4·4	44·4	216
	High Hoyland	120	7·5	58·3	29·1	5·0	0·0	60·6	233
	Penistone	23	4·3	82·6	4·3	8·6	0·0	..	266
	" Infants	276	11·5	69·2	16·6	2·5	0·3	98·0	218
	Silkstone	90	19·7	45·8	23·1	9·2	0·0	34·0	234
Wortley	Wortley	232	18·1	50·4	21·1	10·3	1·2	45·4	275
	Bradfield	64	32·8	48·4	12·5	6·2	0·0	..	253
	Infants	184	15·7	65·7	13·0	5·4	0·5	47·9	338
	Ecclesfield	61	55·7	27·8	6·5	9·8	0·0	..	
	" Infants								

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire Lancashire, Cheshire, and Cumberland, by Dr. Stevens

TABLE F.—*continued.*

APPENDIX. Nos. 1–4. Local Inquiries as to Vaccination. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.	Union.	District.	Number of Children examined.	Per cent. successfully vaccinated.	Per cent. unsuccessfully vaccinated.	Per cent. doubtfully vaccinated.	Per cent. unvaccinated.	Per cent. marked by Small-pox.	Insusceptibles per cent. of Births (from Returns).	Estimated Value of Vaccination, Protection being 1,000.
	Huddersfield	Cumberworth	95	13·6	65·2	17·8	4·2	0·0	5·7*	220
		Folstone	98	18·2	47·3	24·7	9·8	1·0	9·3*	288
		Golcar	133	37·4	62·8	11·3	8·3	3·0	8·1*	282
		Holme	36	19·4	50·0	13·3	16·6	0·0	8·2*	303
		Honley	82	11·9	58·6	21·7	7·6	2·1	6·9*	282
		Kirk Burton	293	49·5	35·5	9·1	5·7	0·0	4·3*	467
		" Infants	23	78·2	21·7	0·0	0·0	0·0	..	653
		Kirk Heaton	129	10·8	50·3	27·1	11·6	4·6	7·0*	236
		Lindley	50	6·0	52·0	20·0	22·0	8·0	6·1*	186
		" Infants	41	2·4	56·0	21·9	19·5	0·6	..	167
		Lockwood	154	6·5	65·6	20·1	8·2	0·7	7·4*	200
		" Infants	59	10·1	74·5	11·8	3·3	0·0	..	233
		Marsden	149	5·3	75·8	15·4	3·5	0·0	8·8*	241
		" Infants	51	1·9	92·1	3·9	1·7	0·0	..	254
		Meltham	86	10·4	59·3	20·9	9·3	1·1	6·4*	206
		" Infants	38	15·4	68·4	7·8	6·2	0·0	..	232
		Slaithwaite	132	26·5	55·3	11·3	6·8	3·0	10·7*	349
		" Infants	61	11·4	77·0	9·8	1·6	0·0	..	281
		Wooldale	133	48·6	25·0	19·0	7·2	0·6	8·3*	493
		Huddersfield, N.	142	13·3	47·1	20·7	7·7	2·8	..	278
		" Infants	279	6·4	59·4	25·8	8·2	1·0	..	205
		Huddersfield, S.	155	6·5	52·2	39·2	10·3	1·9	6·1*	194
		" Infants	50	5·3	42·8	48·2	3·5	0·0	..	173
	Saddleworth	Upper Mill	101	6·9	71·2	14·8	6·9	0·0	..	221
		Delph	139	10·7	64·7	11·5	12·9	0·0	25·0	240
		" Infants	75	6·6	62·6	15·3	17·3	0·0	..	205
		Grotton	51	9·8	64·7	19·6	5·8	0·0	..	242
	Halifax	Brighouse	137	10·2	60·5	20·4	8·7	2·1	5·6†	249
		" Infants	121	8·2	72·7	9·0	9·9	0·8	..	246
		Elland	59	15·2	52·7	15·2	16·9	0·0	6·5†	278
		Halifax	233	11·1	59·6	18·0	11·1	1·2	2·2†	220
		" Infants	93	9·6	58·0	21·5	10·7	0·0	..	217
		North Owram	335	14·6	46·5	26·8	11·9	0·8	8·2†	224
		Rastrick	137	9·5	60·3	17·1	6·9	2·1	9·4†	245
		Ripponden	60	16·6	50·0	20·0	13·3	0·0	7·7†	269
		South Owram	111	9·9	60·3	16·2	4·5	0·0	10·5†	249
		Stainland	147	17·6	46·2	17·0	19·0	8·8	5·4†	261
	North Bierley	N. Bierley, E.	192	82·8	13·0	2·0	2·0	0·5	10·5‡	739
		" Infants	93	84·9	12·9	1·0	1·0	0·0	..	734
		N. Bierley, W.	293	62·5	22·6	11·3	3·4	0·0	9·8‡	605
		Pudsey	192	18·2	54·6	20·3	6·7	0·0	3·9‡	283
		Tong	38	5·5	58·3	25·0	11·1	0·0	9·2‡	204
		Clecktheaton	336	5·1	70·5	14·6	9·5	0·7	3·0‡	216
		" Infants	70	5·5	68·5	22·8	2·8	0·0	..	225
		Idle	197	10·7	57·3	18·7	13·7	3·0	7·7‡	229
		" Infants	85	14·2	65·7	2·8	17·1	0·0	..	249
		Shipley	191	39·7	51·1	14·5	4·5	0·7	4·6‡	377
		" Infants	71	19·7	50·7	23·9	5·6	0·0	..	310
		Thornton	106	10·3	55·4	18·8	12·2	0·0	6·8‡	220
		Wilsden	66	10·6	71·2	12·1	6·0	7·5	6·5‡	277
		" Infants	51	5·8	64·7	21·5	7·8	0·0	..	206
		Calverley	73	24·6	56·1	15·0	4·1	1·3	8·1‡	318
		" Infants	59	25·4	49·1	18·6	6·7	0·0	..	308
		Clayton	216	11·1	54·1	22·6	12·5	1·3	7·8‡	238
		" Infants	27	7·4	62·9	25·9	3·7	0·0	..	232
	Bradford	Bradford, N.E.	449	17·6	43·4	26·0	12·9	3·7	..	257
		Bradford, S.	165	14·2	53·3	19·9	13·4	0·6	..	253
		Bradford, W.	249	17·2	52·2	20·0	10·4	3·0	4·8§	227
		" Infants	243	18·1	52·6	15·6	13·5	1·6	..	259
		Horton, W.	192	17·7	53·8	14·7	11·6	2·6	..	250
		" Infants	110	21·8	57·3	17·2	13·6	0·0	..	246
		Horton E.	168	11·9	59·5	19·6	8·9	1·7	5·7§	204
		" Infants	66	10·6	75·7	7·5	6·0	0·0	..	257
		Bowling	231	28·4	41·3	24·5	5·6	0·0	4·8§	283
		Manningham	255	19·5	47·0	25·0	8·6	1·9	1·6§	253
		" Infants	102	20·5	46·0	25·4	7·8	0·0	..	257
	Keighley	Keighley, N.	321	3·3	58·0	28·9	11·5	2·4	57·6	241
		" Infants	55	3·6	58·1	25·4	12·7	0·0	..	156
		Keighley, S.	89	5·6	59·5	23·5	11·2	4·4	57·5	153

* Per 100 of the population. The births registered in the union for the three years were at the rate of 11·1 per 100 of population.
† Per 100 of the population. Births registered in unions for the three years were 10·7 per 100 of population.
‡ Per 100 of the population. The births registered in the union for the three years were at the rate of 11·5 per 100 of the population.
§ Per 100 of the population for three years. The births in the union during that time being at the rate of 11·2 per 100 of population.

TABLE F.—*continued.*

Unions.	District.	No. of Children examined.	Per cent. said vaccinated.	Per cent. *stiff-formally* vaccinated.	Per cent. not vaccinated.	Per cent. vaccinated.	Per cent. marked by Small-pox.	Infants vaccinated per cent. of Births (from Returns).	Estimated Value of Vaccination. Perfection being 1,000.
	Sutton*	207	4·3	59·4	24·7	11·5	1·4	41·5	178
	Howarth	76	2·6	56·5	17·1	23·6	0·0	30·9	148
	Bingley	263	12·5	55·8	21·6	9·9	2·2	17·1	233
Skipton	Skipton	129	14·7	45·7	27·1	12·4	1·5	57·4	248
	Addingham	105	11·4	63·8	22·8	2·8	0·0	18·5	245
	Kildwick	90	1·1	32·2	45·5	21·1	8·8	41·5	111
	Gargrave	92	8·6	56·5	23·2	6·5	0·0	71·6	197
	,, Infants	70	5·7	84·3	7·1	2·8	1·4	..	232
	Barnoldswick	216	9·2	56·9	19·0	13·8	2·3	17·1	224
	Silsden	205	5·8	61·4	27·3	5·3	1·4	41·5	194
Settle	Settle	124	13·7	55·4	18·5	11·2	0·8	17·3	245
	,, Infants	69	15·0	59·2	13·0	14·4	0·0	..	243
	Bentham	101	29·7	57·3	8·9	11·8	0·0	83·4	302
	Long Preston	43	9·5	49·4	26·1	23·3	4·7	0·0	200
	,, Infants	29	10·3	58·6	24·1	6·8	0·0	..	224
Sedbergh	Sedbergh	172	13·6	58·7	19·1	2·9	0·0	87·8	238
	Dent	66	22·7	50·0	27·2	0·0	0·0	61·8	320
Cockermouth	Cockermouth	185	3·2	53·9	29·1	14·5	3·2	28·1	180
	Maryport	240	5·4	49·4	32·9	21·2	0·0	41·3	144
	Workington	230	13·0	44·7	27·8	14·3	0·0	20·8	235
	Keswick	130	11·5	28·8	54·6	10·0	2·3	12·2	190
Blackburn	Blackburn, I.	271	12·5	61·9	14·7	10·3	5·1		248
	,, Infants	294	8·0	65·7	20·8	4·7	0·0		225
	Blackburn, II.	250	8·8	61·8	17·2	12·8	3·8	51·3	216
	,, Infants	208	9·1	66·3	17·3	7·2	0·0		215
	Blackburn, III.	196	5·6	69·4	12·4	12·4	0·0		213
	Darwen	50	24·0	68·0	8·0	4·0	2·0	33·7	345
	,, Infants	98	26·3	61·9	7·0	5·2	0·0	..	327
	Witton	63	6·3	74·6	7·9	11·1	1·5	70·1	324
	Mellor	88	2·2	76·1	9·0	12·5	0·0	63·3	212
	Oswaldtwistle	133	7·5	70·6	11·2	10·5	1·5		234
	,, Infants	73	12·3	61·6	15·0	10·9	0·0	46·5	236
	Harwood	241	8·3	70·5	17·4	3·7	0·4		188
	Rishton	190	5·0	69·2	16·2	9·3	1·8		294
Ulverstone	Broughton	63	26·9	39·6	33·3	0·0	0·0	74·6	314
	Cartmel	134	4·4	59·2	35·8	1·4	0·0	49·3	191
	Dalton	455	8·8	52·5	31·1	7·2	0·0	70·8	201
	Hawkshead	45	13·3	64·4	20·0	2·2	0·0	60·0	233
	Ulverstone	157	19·7	47·1	22·9	9·5	1·2	32·9	243
	,, Infants	150	20·6	52·6	22·0	4·6	0·0	..	231
Caton (Incorporation).	Caton	116	25·8	44·8	21·5	7·7	0·0	..	325
	Hornby	64	35·9	31·2	21·8	10·9	0·0	..	396
	Halton	294	38·4	44·5	11·9	5·1	0·0	..	314
	Bolton	83	13·2	53·0	25·3	8·4	0·0	..	219

* The following tabular statement of the effect of a late epidemic of Small Pox on the attendance at his scho was furnished to me by the master of the Sutton National School.

Sutton-in-Kildwick National Schdol.
(Keighley Union.)
Small Pox: 1859.
Those with similar marks belonged to same family.

No.	Name.	Date of commencement.	Return to School.	No. of days absent.	Whether vaccinated.	No.	Name.	Date of commencement.	Return to School.	No. of days absent.	Whether vaccinated.
1	P. E.	Jan. 11	April 27	75	No.	15	J. E.	Mar. 30	April 18	19	No.
2	S. S. (*c*)	,, 27	Mar. 7	39	No.	16	G. D. M.	,, 30	(Left school.)		?
3	E. S. (*a*)	Feb. 16	,, 30	42	Yes.	17	S. H.	,, 31	April 13	18	?
4	W. P. (*b*)	,, 21	,, 17	24	No.	18	M. W.	April 4	,, 27	23	No.
5	M. W.	,, 23	April 11	47	No.	19	B. S.	,, 4	May 16	42	?
6	M. H.	,, 28	Mar. 23	28	Yes.	20	W. R.	,, 4	,, 9	35	No.
7	J. B.	Mar. 7	April 4	28	No.	21	S. H. L.	,, 4	,, ?	?	No.
8	C. P. (*b*)	,, 10	May 30	81	No.	22	W. C. (*d*)	,, 5	,, 10	35	Yes.
9	J. W.	,, 11	April 11	31	No.	23	T. P.	,, 5	June 6	62	?
10	J. G.	,, 24	May 2	39	No.	24	M. A. H. (*e*)	,, 8	April 27	20	Yes.
11	S. A. H. (*c*)	,, 25	(Left school.)		No.	25	B. H. (*e*)	,, 11	May 10	29	Yes.
12	H. S.	,, 25	May 30	66	?	26	S. A. M.	,, 13	,, 16	33	?
13	E. W.	,, 25	(Left school.)		?	27	A. C. (*d*)	,, 11	,, 3	21	Yes.
14	E. L.	,, 28	May 2	35	?	28	M. J. H. (*e*)	,, 18	,, 9	31	No.

APPENDIX.

Nos. 1-4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

TABLE F.—*continued.*

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

Union.	District.	Number of Children examined.	Per cent. well vaccinated.	Per cent. indifferently vaccinated.	Per cent. badly vaccinated.	Per cent. un-vaccinated.	Per cent. marked by Small-pox.	Infants vaccinated per Cent. of Births (from Returns).	Estimated Value of Vaccination as a protection between 5 and 20
Lancaster	Lancaster	700	43·5	40·2	9·8	6·2	1·1	29·7	408
	" Infants	250	32·0	46·4	15·2	6·4	0·0	..	330
	Lancaster, N.	70	11·4	50·0	32·8	5·7	0·0	60·5	226
	Lancaster, S.	88	5·6	79·5	12·5	2·2	1·1	97·8	232
	" Infants	99	1·6	81·3	8·4	8·4	0·6	..	225
Garstang	Garstang	116	8·6	65·5	18·1	7·7	0·0	..	209
	Forton	67	2·9	68·6	17·9	10·4	0·0	..	171
The Fylde	Kirkham	81	12·9	70·9	16·1	0·0	0·0	..	235
	Lytham	30	3·3	80·0	16·6	0·0	0·0	..	226
	Infants	85	11·7	60·0	12·9	15·2	0·0	..	209
	Blackpool	167	3·5	76·6	13·1	6·5	0·0	..	216
	" Infants	137	6·5	73·8	6·5	8·0	0·0	..	235
	Fleetwood	223	23·6	48·5	20·1	6·5	0·4	..	256
	" Infants	99	6·0	68·6	16·1	9·0	0·0	..	207
	Poulton	80	13·7	48·7	26·2	11·2	0·0	..	230
Preston	No. 1.	164	22·5	52·4	17·0	7·9	1·8	..	253
	" Infants	106	27·3	39·6	13·2	19·8	0·0	..	224
	No. 2.	613	23·0	46·8	18·4	11·7	1·1	..	254
	" Infants	244	18·4	41·3	20·9	18·8	0·0	..	218
	No. 4.	164	25·6	48·7	17·6	7·8	0·0	..	253
	" Infants	139	15·8	56·1	15·1	12·9	0·0	..	213
	No. 5.	253	25·2	46·6	17·7	10·2	1·5	..	240
	" Infants	172	30·8	40·6	19·1	9·3	0·0	..	259
	No. 6.	222	18·9	45·9	21·6	13·0	2·2	..	226
Ormskirk	Ormskirk	182	31·8	35·7	21·4	10·9	0·0	..	345
	" Infants	143	11·1	58·7	16·6	13·9	0·0	..	218
	Rufford	183	27·5	47·2	24·7	10·4	0·0	..	253
	North Meols	311	11·2	54·0	23·7	10·9	0·0	..	218
	" Infants	228	10·9	60·9	12·7	15·3	0·4	..	212
	Formby	58	3·4	84·4	12·0	0·0	0·0	..	233
	" Infants	48	2·0	66·6	27·0	4·1	0·0	..	187
Wigan	Ashton	83	6·0	66·2	19·2	8·4	1·2	58·9	208
	" Infants	68	7·3	47·0	27·9	17·6	0·0	..	179
	Aspull	118	38·1	27·9	25·4	8·4	0·8	80·5	245
	Hindley	160	14·3	39·3	34·3	11·8	1·8	39·6	215
	" Infants	123	13·8	47·9	26·0	12·1	0·0	..	206
	Pemberton	146	17·8	32·8	34·2	15·0	4·1	98·3	211
	" Infants	111	18·9	44·1	27·0	9·9	0·0	..	226
	Standish	164	7·3	54·8	29·2	8·5	1·8	61·9	204
	Upholland	179	8·9	49·1	36·3	5·5	0·3	107·5	205
	Wigan, No. 1.	184	7·0	46·7	22·8	23·3	8·5	} 68·0	175
	" No. 2.	233	3·0	63·0	28·7	5·1	0·4		197
	" " Infants	42	7·2	61·9	21·4	9·5	0·0		205
W. Derby	Great Crosby	73	9·5	43·8	32·8	13·6	2·7	66·3	179
	" Infants	81	18·5	49·3	25·9	6·1	0·0	..	212
	Litherland	81	11·1	58·0	18·5	12·3	0·0	12·5	207
	" Infants	59	6·7	62·7	23·7	6·7	0·0	..	197
	Bootle	188	7·9	53·6	26·5	11·1	1·0	21·5	200
	" Infants	91	3·2	59·3	25·2	12·0	0·0	..	179
	Everton, No. 1.	134	4·4	68·2	26·0	11·1	2·2	26·7	188
	" Infants	56	3·5	57·1	25·0	14·2	0·0	..	167
	Kirkdale	60	3·3	45·0	33·3	18·3	1·6	14·7	147
	Walton	20	20·0	55·0	25·0	0·0	0·0	15·7	273
	" Infants	71	24·3	36·5	24·3	14·6	2·4	..	248
	West Derby (Rural)	109	35·7	27·5	27·5	9·1	0·0	16·0	251
	" Infants	97	31·9	43·2	10·3	14·4	0·0	..	279
	" (Municipal No. 1.)	360	9·3	56·3	27·8	6·4	0·0	..	201
	" Infants	91	3·2	60·4	30·7	5·4	0·0	} 36·1	180
	" (Municipal No. 2.)	189	15·5	52·2	28·3	3·8	0·0		230
	" Infants	192	15·1	49·4	31·2	4·1	0·0		221
	Wavertree	48	10·4	41·6	41·6	6·2	0·0	10·1	182
	" Infants	119	11·7	49·5	31·9	6·7	0·0	..	208
	Garston	132	16·6	47·0	28·0	8·3	0·7	22·3	250
	" Infants	70	5·7	61·4	30·0	12·8	0·0	..	193
	Everton, No. 2.	216	6·4	53·2	36·1	4·1	0·9	26·7	191
	" Infants	96	9·3	64·5	16·6	9·3	0·0	..	210
	Aintree	52	23·0	30·7	32·6	13·4	0·0	640·6	251
Toxteth Park	Toxteth Park, No. 1.	177	8·4	49·7	34·4	7·3	1·6	..	187
	" Infants	152	10·5	55·9	26·9	6·5	0·0	..	219
	" No. 2.	174	14·9	59·1	18·3	7·4	0·0	..	232
	" Infants	134	16·4	49·2	29·8	4·4	0·0	..	221

TABLE F.—*continued.*

Union.	District.	Number of Children examined.	Per cent. vaccinated.	Per cent. unsatisfactorily vaccinated.	Per cent. badly vaccinated.	Per cent. unvaccinated.	Per cent. marked by Small-pox.	Infants vaccinated per cent. of Births (from Returns).	Estimated Value of Vaccination, Perfection being 1,000.
Liverpool	No. 1.	153	11·7	54·9	24·8	8·4	1·9	..	204
	„ Infants	152	6·8	62·1	19·6	11·3	0·0	..	204
	No. 2.	115	10·4	42·6	40·0	6·9	0·0	..	183
	„ Infants	96	8·3	62·5	22·9	6·2	0·0	..	214
	No. 3.	132	8·9	36·3	38·3	16·6	2·6	..	168
	„ Infants	139	8·6	58·2	20·8	12·2	0·0	..	196
	No. 4.	167	9·5	46·1	30·5	13·7	3·5	..	192
	„ Infants	129	12·4	53·4	26·3	7·7	0·7	..	206
	No. 6.	216	5·5	52·3	28·7	13·4	1·3	..	179
	No. 6.	93	6·4	55·9	24·7	12·9	0·0	..	192
	„ Infants	66	10·6	54·5	25·7	9·0	0·0	..	197
	No. 7.	177	6·2	57·6	31·6	4·5	1·1	..	193
	„ Infants	69	8·6	59·4	14·4	17·3	0·0	..	193
	No. 8.	122	13·1	54·9	23·7	8·1	0·8	..	206
	„ Infants	43	16·3	60·4	18·6	4·6	0·0	..	236
	No. 9.	236	13·5	45·7	33·8	6·8	1·2	..	205
	„ Infants	137	19·7	44·5	23·6	13·1	0·7	..	235
	No. 10.	62	6·4	41·9	41·9	9·6	0·0	..	156
	No. 11.	163	13·3	50·6	24·0	12·3	0·0	..	200
	„ Infants	50	12·0	58·0	20·0	12·0	0·0	..	201
	No. 12.	202	16·8	42·0	33·6	7·4	0·4	..	220
	„ Infants	78	15·3	46·1	28·2	10·2	0·0	..	209
Prescot	Prescot	181	2·7	56·9	28·7	11·0	0·5	66·3	153
	„ Infants	124	2·2	42·7	41·1	12·9	0·0	..	147
	St. Helen's	257	2·3	53·6	32·6	11·2	1·9	64·7	174
	„ Infants	100	7·3	55·9	22·0	14·6	0·0		189
	Sutton	141	4·9	51·0	32·6	11·3	1·4		181
	„ Infants	50	6·0	48·0	42·0	10·0	0·0		152
	Farnworth	91	2·3	59·3	21·4	17·3	0·0	24·7	133
	„ Infants	55	1·8	38·1	20·0	20·0	0·0	..	144
	Woolton	149	14·0	52·3	24·1	9·3	0·6	45·4	236
	„ Infants	61	3·3	59·0	19·6	18·0	0·0	..	176
	Rainford	123	8·1	62·7	21·7	12·4	0·0	62·6	189
	Hale	134	8·2	48·5	29·8	13·4	0·0	37·1	211
	Huyton	73	4·1	38·3	43·8	13·6	0·0	17·6	152
Leigh	Leigh	97	6·1	51·1	30·9	11·3	7·2	..	181
	„ Infants	72	2·7	37·5	37·5	22·2	1·3	..	148
	Atherton	85	5·8	57·7	23·1	9·1	0·0	33·6	168
	„ Infants	101	2·9	54·4	31·6	10·8	0·9	..	170
	Astley	131	2·2	56·4	28·2	12·9	4·5	208·5	177
	„ Infants	40	2·5	50·0	32·5	15·0	0·0	..	136
	Tyldesley	272	5·8	46·3	31·6	16·1	1·1	18·5	177
	„ Infants	131	3·3	44·3	34·4	17·8	0·0	..	167
	Lowton	84	4·7	50·0	23·7	21·4	9·5	62·2	164
	Culcheth	101	11·8	54·4	27·7	5·9	0·0	16·9	215
	Bedford	110	3·6	40·9	36·3	19·0	2·7	34·5	147
Warrington	Newton	165	10·3	55·7	30·3	3·6	1·2	57·1	216
	„ Infants	81	13·5	48·1	29·6	8·5	0·0	..	202
	Latchford	149	2·0	56·5	28·9	2·8	0·0	66·1	158
	„ Infants	65	3·0	63·0	24·6	9·2	0·0	..	163
	Penketh	62	0·0	51·6	33·8	14·5	0·0	14·2	134
	Warrington	229	1·7	51·0	35·2	11·7	3·0	64·8	153
	„ Infants	150	0·6	58·3	31·3	14·6	0·6	..	147
	Rixton	89	11·2	34·8	41·5	12·3	0·0	45·4	183
Bolton	Great Bolton, E.	263	21·6	34·9	34·9	8·3	0·0	..	210
	„ Infants	140	31·4	28·5	35·7	4·2	0·0	..	257
	„ W.	202	23·7	36·6	34·6	4·9	0·9	..	223
	„ Infants	71	30·9	36·6	28·1	4·2	0·0	..	270
	Little Bolton	193	34·1	27·4	34·1	4·1	0·0	..	249
	„ Infants	99	33·3	25·2	38·3	3·0	0·0	..	245
	Lever	89	19·1	47·1	25·7	7·8	1·1	..	241
	Turton	44	15·9	54·5	18·1	11·3	2·2	..	216
	„ Infants	42	19·0	35·7	35·7	9·5	0·0	..	199
	Farnworth	167	0·5	33·3	52·2	10·7	1·1	..	139
	„ Infants	91	6·5	40·6	41·7	10·9	0·0	..	186
	Harwood	146	16·4	33·5	36·3	13·7	0·6	..	203
	Horwick	81	25·9	41·9	25·9	6·1	0·0	..	240
	„ Infants	91	15·3	42·8	32·9	8·7	0·0	..	211
	West Houghton	155	15·4	28·3	40·6	16·1	0·6	..	173
	Sharples	394	27·1	32·4	34·7	5·5	0·0	..	230
	„ Inmates	133	17·2	26·3	48·1	8·2	0·0	..	198

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

TABLE F.—*continued.*

APPENDIX. Nos. 1–4. *Local Inquiries as to Vaccination.* 3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.	Union.	District.	Number of Children examined.	Per cent. efficiently vaccinated.	Per cent. indifferently vaccinated.	Per cent. Insusceptible vaccinated.	Per cent. not vaccinated.	Per cent. marked by small-pox.	Infants vaccinated per cent. of Births (from Returns).	Estimated Value of Vaccination in Protection Lcline 1,000.
	Chorley	Chorley	279	3·5	53·7	35·1	7·5	0·7	64·4	176
		„ Infants	260	5·0	55·0	36·1	3·8	0·0	..	171
		Brindle	101	6·0	53·4	33·6	10·8	0·0	71·5	148
		„ Infants	32	0·0	50·2	25·0	18·7	0·0	..	132
		Rivington	94	3·1	47·8	42·5	6·3	0·0	155·6	144
		Leyland	201	3·9	53·7	34·8	7·4	0·0	61·8	173
		„ Infants	66	4·3	60·6	24·2	10·6	0·0	..	191
		Croston	151	3·3	54·3	37·0	4·6	1·3	67·8	168
	Clitheroe	Clitheroe	394	6·5	56·9	27·0	8·5	3·2	55·7	188
		„ Infants	86	1·1	60·4	27·9	10·5	0·0	..	163
		Whalley	163	13·5	48·6	33·8	3·8	0·0	73·2	233
	Burnley	Burnley	339	7·9	56·6	26·8	8·5	1·4	..	194
		„ Infants	48	0·0	58·3	33·3	8·3	0·0	..	161
		Habergham Eaves	304	9·5	49·3	30·5	10·5	1·3	..	207
		„ Infants	51	3·9	52·9	33·3	9·8	0·0	..	176
		Marsden	155	5·8	58·1	23·2	5·1	1·2	..	211
		Pendle	95	5·2	56·8	23·4	9·4	0·0	..	195
		„ Infants	42	7·1	52·3	23·1	14·3	0·0	..	199
		Colne	103	1·5	57·0	25·3	6·6	0·5	..	176
		Padiham	132	19·6	55·3	18·1	6·8	1·5	..	233
		„ Infants	79	18·9	59·1	22·7	5·6	0·0	..	252
		Hopton	46	8·6	56·5	34·7	0·0	0·0	..	200
	Todmorden	Heptonstall	104	15·3	50·0	30·7	3·8	0·0	52·2	229
		Wadsworth	98	14·2	44·8	30·6	10·2	0·0	55·9	225
		Erringden	132	9·0	55·7	28·0	9·0	1·5	48·8	243
		Todmorden	356	5·0	51·3	32·5	7·8	0·8	11·4	179
		Stansfield	106	13·2	46·2	37·7	3·7	0·0	10·5	228
	Rochdale	Castleton	107	13·1	54·2	26·1	7·4	0·0	49·2	231
		„ Infants	84	11·9	57·1	27·3	3·5	1·1	..	236
		Spotland	110	3·6	51·8	40·0	4·5	0·0	61·0	189
		„ Infants	73	13·3	49·3	34·2	4·1	0·0	..	198
		Whitworth	155	3·8	45·5	43·2	8·3	0·0	52·9	151
		Wardleworth	207	1·9	55·2	21·3	11·1	4·8	47·9	171
		„ Infants	89	13·3	48·7	30·3	15·3	0·0	..	211
		Blatchinworth	66	7·5	59·0	30·3	13·1	4·5	62·9	198
		Butterworth	132	3·0	59·8	21·9	15·1	0·0		135
		„ Infants	58	1·7	68·9	24·1	5·1	0·0	..	171
	Haslingden	Haslingden	189	5·2	51·3	32·8	10·5	0·5	44·4	185
		Edenfield	133	6·0	62·4	26·3	4·5	0·0	37·7	223
		Bacup	237	12·6	48·8	33·7	6·7	0·8	..	209
		New Church	203	22·6	45·8	23·1	5·3	0·4	75·9	242
		Rossendale	189	17·9	55·9	21·6	3·3	0·4	95·7	243
		„ Infants	60	43·3	33·3	18·3	5·0	0·0	..	262
		Accrington	101	8·9	55·4	22·7	12·8	1·0	27·4	209
		„ Infants	94	8·5	58·5	21·2	11·7	0·0	..	186
	Bury	Radcliffe	165	13·3	53·3	30·3	3·0	0·0	36·5	255
		„ Infants	24	4·1	41·6	41·6	12·5	0·0	..	152
		Pilkington, No. 1.	177	9·6	53·1	28·8	8·4	1·1	42·1	219
		„ Infants	70	7·1	38·5	42·8	11·2	0·6	..	178
		„ No. 2.	220	17·7	41·8	34·0	6·3	0·4	62·7	253
		Heap	136	48·5	30·1	19·1	2·2	0·0	76·7	445
		„ Infants	64	51·5	31·2	14·0	3·1	0·0	..	432
		Tottington	125	13·5	60·6	16·1	9·6	0·0	40·6	225
		Bury	248	33·4	40·2	20·9	6·3	0·2	19·3	326
	Birkenhead	Claughton	204	11·2	56·3	23·9	8·3	0·0	..	216
		„ Infants	94	5·3	70·2	9·5	14·8	1·0	..	201
		Birkenhead	153	8·4	64·7	15·0	11·6	1·3	..	208
		„ Infants	140	7·1	68·5	11·4	12·8	0·7	..	199
		Tranmere	118	9·3	61·0	17·8	11·8	0·8	..	194
		„ Infants	119	8·4	65·4	21·0	15·1	0·8	..	186
		Wallasey	196	0·6	53·0	27·5	19·7	0·3	..	135
		„ Infants	158	10·1	60·1	17·7	12·0	0·5	..	210
		Tattenhall	114	4·1	37·7	43·8	12·2	0·0	..	153
	Great Boughton	Great Boughton	149	21·1	43·3	17·4	10·0	2·0	..	244
		„ Infants	91	14·2	40·6	21·9	22·0	0·0	..	178
		Tarvin	98	2·6	76·3	13·1	7·8	0·0	..	209
		Bebington	176	12·5	53·2	23·8	11·3	0·0	..	199
		„ Infants	81	9·8	69·4	12·3	17·2	0·0	..	224
		Neston	75	10·6	61·3	24·0	4·0	0·0	..	221
		„ Infants	85	1·1	69·4	21·1	8·2	0·0	..	187
	Chester	Chester	673	17·0	43·2	24·2	15·8	1·7	44·8	203
		„ Infants	99	16·1	20·2	31·3	32·3	3·0	..	153

TABLE F.—*continued.*

Union.	District.	Number of Children examined.	Per cent. well vaccinated.	Per cent. indifferently vaccinated.	Per cent. not vaccinated.	Per cent. unprotected by Small-pox	Infants vaccinated per cent. of Births. (From Returns).	Estimated Value of Vaccination. Prevention being 1,000.
Nantwich	Audlem	77	5·1	45·4	37·6	11·6	0·0	68·3	170
	Bunbury	168	7·7	63·0	26·1	2·9	0·0	73·6	209
	Crewe	123	8·1	62·6	18·0	10·5	0·0	57·7	217
	" Infants	72	6·9	72·2	13·8	6·9	0·0	..	238
	Haslington	84	9·5	59·5	19·0	11·9	0·0	96·3	217
	" Infants	40	5·0	60·0	25·0	10·0	0·0	..	175
	Nantwich	253	2·3	68·8	20·8	7·8	0·0	47·3	200
	Targarley	149	4·8	55·6	36·9	4·6	0·0	69·1	164
	Wrenbury	51	7·8	66·6	23·5	3·9	0·0	77·4	208
	Wybunbury	49	6·1	67·3	20·4	6·1	0·0	85·9	208
Congleton	Congleton	233	11·3	40·7	33·4	13·4	0·4	56·0	181
	Biddulph	130	9·3	52·3	27·6	10·7	1·5		210
	" Infants	113	10·6	57·5	21·2	10·6	0·0	..	236
	Ch: Hulme	156	13·4	48·0	34·6	3·8	0·0	87·9	213
	Sandbach	94	7·4	53·1	21·2	18·0	0·0	72·6	202
Macclesfield	Alderley, &c.	90	10·0	50·6	33·3	4·4	0·0	..	211
	Bollington	134	29·1	37·3	26·8	9·7	0·0	..	207
	" Infants	130	19·4	43·9	18·7	12·9	0·7	..	262
	Rainow	141	26·9	44·6	21·2	7·1	0·0	..	346
	Macclesfield	168	23·0	38·6	25·0	11·2	0·0	..	296
	" Infants	92	18·0	47·8	25·5	8·5	0·0	..	284
Stockport	Cheadle	132	26·5	39·3	28·0	6·0	0·0	..	302
	Heaton Norris	424	8·4	53·3	29·4	8·8	0·9	..	197
	" Infants	144	6·5	43·1	41·6	7·6	0·0	..	179
	Hyde	209	22·4	33·0	33·0	11·4	0·4	..	241
	" Infants	92	29·3	39·1	23·9	7·6	0·0	..	246
	Marples	89	1·1	57·3	24·7	17·9	0·0	..	169
	" Infants	69	1·4	45·4	34·7	20·2	0·0	..	137
	Stockport	365	8·0	49·4	32·0	10·2	0·0	..	180
	" Infants	70	7·5	40·8	37·8	7·5	0·0	..	153
Altrincham	Altrincham	89	17·9	46·0	24·7	11·2	0·0	..	268
	" Infants	83	28·9	42·1	19·2	9·6	0·0	..	347
	Ashton-in-Mersey	186	6·4	52·1	28·3	12·3	0·5	..	181
	" Infants	61	22·0	59·0	16·3	1·6	0·0	..	204
	Lymm	142	11·9	60·5	20·4	7·0	0·7	..	257
	" Infants	66	10·6	40·9	16·6	22·7	0·0	..	255
	Knutsford	91	26·3	37·3	18·6	17·5	0·0	..	338
	Tabley	149	15·7	44·2	26·8	10·0	0·5	..	253
	" Infants	117	25·6	46·1	16·2	11·9	0·0	..	312
	Wilmslow	174	13·0	58·6	19·2	9·7	0·0	..	228
Northwich	Northwich, No. 1.	192	5·4	55·2	27·6	11·9	0·0	96·1	182
	" Infants	121	4·0	67·7	22·3	5·7	0·0		210
	Northwich, No. 2.	98	4·5	42·4	40·9	12·1	0·0		172
	" Infants	31	9·6	58·0	22·5	9·6	0·0		180
	Weaverham, No. 1.	157	5·7	64·3	22·2	7·0	0·0	88·4	193
	" No. 2.	86	6·0	62·7	25·4	5·8	2·8		212
	" Infants	88	5·6	72·7	18·1	3·4	1·1		232
	Winsford	195	29·2	36·1	31·4	3·3	0·9	64·4	249
	" Infants	46	30·0	26·0	21·7	21·7	0·0		327
	Over	183	16·9	46·9	27·8	8·1	0·5		216
	" Infants	119	15·9	61·3	15·4	9·2	0·0		230
Runcorn	Runcorn	157	7·8	59·8	27·4	5·0	0·0	75·7	200
	" Infants	199	2·2	55·2	24·6	17·5	0·0		174
	Halton	93	2·2	64·0	26·9	6·7	0·0	32·7	174
	" Infants	95	2·1	44·2	43·1	10·5	0·0	..	167
	Frodsham	146	2·8	62·3	22·6	13·6	0·0	76·3	174
	" Infants	92	2·1	65·2	19·5	13·0	0·0	..	171
	Budworth	73	4·1	65·2	29·1	1·3	0·0	56·1	204
Oldham	Middleton	127	1·5	54·5	34·6	9·4	0·0	..	174
	Royton	150	8·1	54·0	27·6	10·0	2·5	..	208
	Crompton	143	18·8	44·7	30·7	5·8	0·7	..	234
	" Infants	83	14·4	32·5	44·5	8·4	1·2	..	227
	Chadderton	69	0·0	40·5	36·2	23·1	0·0	..	151
	Oldham (St. Mary's)	237	4·2	56·1	35·8	3·7	1·2	..	202
	" Infants	85	2·3	48·2	44·7	4·7	0·0	..	175
	Werneth	244	4·0	45·0	47·1	3·6	0·8	..	201
	" Infants	121	1·6	47·1	47·1	4·1	0·0	..	158
	Waterhead	187	11·7	51·8	28·3	8·0	0·0	..	230
	" Infants	41	4·8	58·5	34·8	2·4	0·0	..	200
	Mumps	66	0·0	28·7	57·5	4·5	0·0	..	174
	" Infants	74	8·1	52·7	27·0	13·1	0·0	..	205
	Westwood	255	5·4	53·7	35·2	5·4	0·0	..	190

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

TABLE F.—*continued.*

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

Union.	District.	Number of Children examined.	Per cent. well vaccinated.	Per cent. ill-effects only vaccinated.	Per cent. doubtfully vaccinated.	Per cent. not vaccinated.	Per cent. marked by small-pox.	Infants vaccinated per cent. of Births (from Returns).	Estimated Value of Vaccination being 1,000.
Ashton-under-Lyne	Audenshaw	125	12·8	42·4	32·0	12·8	4·0	49·1	208
	Denton	185	27·0	41·6	26·4	4·8	0·0	52·3	226
	Stayley	113	12·3	53·9	20·3	13·2	0·8	58·6	222
	Dukinfield (Stayley)	217	23·5	40·5	28·5	7·3	2·3	56·4	263
	Dukinfield (Proper)	209	10·7	53·1	21·5	8·6	0·9	43·1	204
	" Infants	36	31·2	38·8	23·9	6·2	1·0	..	348
	Godley, &c.	89	8·7	48·7	33·7	8·7	0·0	52·7	201
	" Infants	50	10·0	64·0	20·0	6·0	0·0	..	229
	Mottram, &c.	121	4·9	71·0	17·3	6·6	0·0	95·1	200
	Knott Lane, &c.	274	11·6	58·0	21·9	8·4	2·1	56·3	230
	Ashton	384	6·7	57·8	25·2	10·1	3·5	36·2	200
	Leess	238	10·5	36·5	33·3	20·5	0·4	37·3	196
	Mossley	149	10·7	31·5	42·9	14·7	0·0	46·0	204
	" Infants	29	27·5	24·1	37·9	10·3	0·0	..	320
Barton-on-Irwell	Barton, N.	116	6·0	42·2	45·7	6·0	0·0	51·5	184
	" Infants	40	2·0	46·9	32·6	16·5	2·0	..	149
	Barton, S.	83	1·2	32·5	48·1	18·0	0·0	51·5	171
	Stretford	163	11·6	42·3	33·7	12·2	0·0	30·2	189
	Worsley	231	6·4	51·5	36·3	5·6	0·8	59·0	180
	" Infants	93	4·3	39·7	43·0	12·9	0·0	..	133
Prestwich	Prestwich	209	11·0	35·8	37·8	15·3	0·4	41·9	190
	Cheetham	163	7·9	37·4	30·8	14·7	1·2	26·8	184
	" Infants	68	41·1	14·7	32·3	11·7	0·0	..	365
	Newton	101	5·9	55·4	36·6	1·9	0·0	45·0	201
	" Infants	76	7·1	44·2	37·1	11·4	0·0	..	176
Choriton	Hulme, No. 1.	182	3·8	52·7	34·6	8·7	1·1	..	176
	" Infants	121	2·4	42·9	40·5	14·0	0·8	..	158
	Hulme and Chorlton	247	6·4	40·0	44·5	8·9	1·2	..	171
	" Infants	224	6·2	42·8	37·5	13·3	0·0	..	168
	Hulme, No. 2.	178	2·0	44·9	39·3	10·1	0·5	..	162
	" Infants	123	7·3	44·7	37·4	10·5	0·0	..	174
	Chorlton	188	5·8	49·4	40·9	3·7	0·0	..	202
	Ardwick	228	8·3	42·5	43·4	5·7	0·8	..	199
	" Infants	103	1·8	50·9	31·4	15·7	0·0	..	139
	Openshaw	147	12·9	24·4	55·1	7·4	0·0	..	180
	Rusholme	123	11·3	26·8	53·6	8·1	0·8	..	186
	" Infants	126	15·8	38·0	38·0	7·9	0·0	..	228
	Didsbury	316	13·2	35·7	43·6	7·2	0·0	..	209
	" Infants	86	9·3	38·3	45·3	6·9	0·0	..	176
	Levenshulme	116	10·3	41·3	41·3	6·3	0·8	..	192
	" Infants	68	7·3	42·6	36·7	13·2	0·0	..	171
Manchester	Deansgate	159	2·5	45·9	42·7	8·7	1·8	76·4	165
	" Infants	103	11·6	45·6	39·8	2·9	0·0	..	210
	Amcoats	101	10·8	44·5	25·7	15·8	0·9	62·7	196
	" Infants	57	12·2	38·5	33·3	15·7	5·2	..	186
	London Road	184	9·7	35·3	45·6	9·2	1·0	62·0	195
	" Infants	117	5·0	45·6	44·8	8·5	0·0	..	167
	St. George's	173	10·4	42·2	38·1	9·2	1·7	67·7	183
	" Infants	68	11·7	35·2	39·7	13·2	1·4	..	190
	Market Street	171	10·5	26·9	52·0	10·5	1·7	42·9	172
	" Infants	78	6·4	28·2	50·0	15·3	0·0	..	151
Salford	Salford, S.	127	9·4	41·7	39·3	9·4	0·0	47·3	200
	" Infants	150	10·0	44·0	34·6	11·3	0·6	..	211
	Salford, N.	130	12·3	40·7	35·5	11·5	1·5	66·9	207
	" Infants	101	9·9	41·5	36·6	11·8	0·0	..	193
	Pendleton	130	16·1	32·3	22·3	9·2	0·7	51·8	255
	" Infants	86	11·6	39·5	40·6	8·1	0·0	..	188

The general aspect of the above table augurs very badly for the condition of most of the populations in the event of a visitation by small-pox. But as, from such a mass of figures as is embraced by this table, it is very difficult to draw conclusions, I have placed together in a tabular form (Table I.) the districts in which I have met with the largest amount of small-pox. Opposite the names of those districts I have placed the number indicative of the estimated value of the vaccination in each, and the result to them of the late epidemic (1862–3).

Nos. 1–4. *Local Inquiries as to Vaccination.*

III. CAUSE OF THE DEFECT.

From what has gone before it must appear, that both in quantity and quality the vaccination in the districts visited is very defective. This shortcoming is referrible to a number of causes mostly acting together; but these are all the result of the incompleteness of the so-called Compulsory Act. The great fault to be found with this enactment (16 & 17 Vict. c. 100.) is, that, although styled compulsory, the enforcement of its provisions is merely optional with the authorities appointed to administer it. Another fault almost equally grave is the very defective framing or wording of the Act itself, so that in many instances in which the administering authorities have endeavoured to give effect to its penal clauses they have failed.

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

As I have prosecuted my inquiries under certain heads, these and other causes of failure in securing completeness in quantity and efficiency in quality of the vaccination will appear in their proper places, if I proceed to an analysis of the different items of my inquiry seriatim :—

(*a.*) Division of union, and times appointed for the attendance of contractors at stations to vaccinate.

By the enactment just referred to, the guardians of every union, &c. were required to apportion it out into convenient vaccination districts. This has generally been fairly done, by adopting the division made for the purposes of Poor Law medical relief. As a general rule this plan works very well. In some unions, however, as in Dewsbury, Leigh, and the Carlton, Barwick, and Great Preston incorporations, it has been the custom to ignore these districts, and to contract with every legally qualified medical practitioner living in the union or incorporation. This latter mode, besides leading to contentions and many inconveniences, tends materially to deteriorate the quality of the vaccination, owing to its too great subdivision.

Times appointed.

The injudicious nature of the times appointed for the attendance of the vaccinators at stations to vaccinate leads in many districts to failure in the endeavour to establish systematic stational vaccination; the result is, disappointment both to the public and to the operator, and the almost necessary alternative of adopting a house-to-house plan of vaccinating with stored lymph. This mode of vaccinating is very unreliable; and I am happy to be able to report that as my inquiries proceed I meet with an increasing conviction on the part of the medical profession that this is the case.

To give a few instances of what is meant by the injudicious nature of the arrangements or appointments for attending stations :—All the districts of the Clitheroe union were open to this objection. In the Chipping district the annual births averaged 95, and the attendances to vaccinate required of the contractor, and duly scheduled to contract, were 156. In Clitheroe district, average births 325; attendances required 416. In Gisburne district, births 78, and attendances expected 364 (more than four for each child born). In Slaidburn district, annual births 64; attendances to vaccinate 156. In Whalley district 82 births in the year, and 104 attendances to vaccinate the children were contracted to be made. In the Bebington district of the Wirral union the contractor was expected to attend 573 times to vaccinate an average of about 200 children annually born. It resulted that he never operated on half the number; and in 1860, only 46 children of all ages were vaccinated by him. Many other similar examples could be given. In Ecclesall Bierlow and Great Ouseburn unions, &c.

the public vaccinator contracted to vaccinate "at the residence of the "said (contractor) at nine o'clock on every Monday morning, and also "at all other reasonable hours every day (except Sunday) when at "home, and not otherwise professionally engaged." This can hardly be said to afford facilities for arm-to-arm, or for any other kind of vaccination. And it is difficult to understand what benefit the poor and uneducated could derive from the contracted-for arrangements in the Hemsworth union which were thus set forth on the contracts "at all reasonable times at the home of any child residing in" (here the name of some village in the union) "on a written request *so to do* being left for *him* at" (here the particular house is indicated). In several unions no times were specified, and in some no stations were fixed nor times appointed. It was very rare indeed to meet with a union in which the contracted-for arrangements for vaccinating were complied with. Sometimes their inadequacy was a tenable excuse for this neglect, and at others the contractor chose to follow his own course, which was in a great majority of instances to vaccinate from house to house as opportunity served.

(*b.*) Contracts, terms, dates, and practice as to payment.

The guardians are further required by the before-mentioned Act to contract with some legally qualified medical practitioner for the vaccination of the different districts into which the unions are to be divided. This had been properly done, and the contracts were inspected by me in 49 only of the 79 unions visited. In some unions only certain of the public vaccinators were contracted with.

The terms of the contracts, or the payments made for vaccination where there were no contracts, were almost uniformly the statutory minimum, 1*s.* 6*d.* for cases within and 2*s.* 6*d.* for those beyond two miles from the residence of the public vaccinator. In two instances only did I find this practice departed from, viz., in the Northwich union, in which 2*s.* and 3*s.* were the sums allowed, and in one district of the Lancaster union in which 2*s.* and 2*s.* 6*d.* were paid. Many of the contractors were bound by old contracts, that is, dated before the Act of 1853; these allowed only the uniform rate of 1*s.* 6*d.* for all cases. In some few instances the actual payment to these older contractors had been put on a level with that to their junior brethren. In several unions it had been the practice to hold out the vaccination contract as a bait or inducement to a medical practitioner to accept the Poor Law medical district at a reduced salary, and this not unsuccessfully. I ascertained that such reductions had been made on such terms in many instances. This has been done by boards of guardians in consequence of the positive nature of the enactment of the Act of 1853, that no less payment for vaccination than 1*s.* 6*d.* and 2*s.* 6*d.* shall thenceforth be legal. This is one mode of evading the law adopted by guardians; another is, to fill up the contracts with the statutory minimum terms, and then to extort from the contractor an undertaking that he will only charge 1*s.* 6*d.* for all cases. On obtaining this undertaking the bargain is completed, and the contract is submitted to the Poor Law Board for its approval. A case of this kind was actually pending between the Bury board of guardians and an expectant contractor at the time of my visit. There is one argument, in addition to the above, which appears to justify the belief that arranging for the vaccination of the country should not devolve upon Poor Law guardians, and that is, the stigma of parochiality which attaches to the acceptance of vaccination by the poorer classes at the hands of public vaccinators, owing to the known interference and authority in the matter of the Poor Law guardians. In the Rochdale union I was shown a contract dated since 1853, and of

the newer form, in which the term of payment was only 1*s.* 6*d.* for all cases, and this had in some unaccountable way received the sanction of the Poor Law Board.

In some unions it is the practice for the clerk only to allow payment for such cases of successful vaccination as have been certified to the registrars. This practice, owing to the incompleteness of the present forms of contracts, is rather a straining of the law, but it has very useful results, shown in the greater completeness of the entries in the registrar's register of successful vaccination, and therefore that officer's increased receipts and more active co-operation.

In Table G. I have enumerated the unions visited, and I have shown how far the requirements of the law in respect of contracts with public vaccinators have been complied with.

TABLE G.

Union.	Public Vaccinators under Contract.	Dates.	Terms paid.	Practice as to payment.
Barnsley	2 out of 6	1862	Stat. min.	Without certificates.
Barwick (Incorporation).	None	—	Do. also 2*s.* and 2*s.* 6*d.*	Do.
Bierley, North	All	New	Stat. min.	Do.
Bradford	4 out of 7	Do.	Do.	Do.
Bramley	All	Do.	Do.	None yet made.
Carlton (Incorporation).	24 out of 21	Do.	Do.	Without certificates.
Dewsbury	All	20 new, 5 old	Do.	Only certified cases.
Doncaster	All	New	Do.	Without certificates.
Ecclesall Bierlow	All	Do.	Do.	Only certified cases.
Goole	None	—	Do.	Without certificates.
Halifax	Could not be found	Old	Uniform 1*s.* 6*d.*	Do.
Hemsworth	All	New	Stat. min.	Only certified cases.
Holbeck	All	Do.	Do.	Without certificates.
Huddersfield	15 out of 18	Do.	Do.	Only certified cases.
Hunslet	All	Do.	Do.	Do.
Keighley	All	Do.	Do.	Do.
Knaresboro'	All	Do.	Do.	Without certificates.
Leeds (Township)	4 out of 6	4 new	Do.	Only certified cases.
Ossebarn, Great	All	New	Uniform 2*s.* 6*d.*	Without certificates.
Pateley Bridge	2 out of 3	Do.	Stat. min.	Do.
Penistone	None	—	Do.	Only certified cases.
Pontefract	All	New	Do.	Without certificates.
Preston Great (Incorporation).	3 produced out of 11.	2 old	?	?
Ripon	3 out of 4	1 old, 2 new	Stat. min.	?
Rotherham	All	2 old, 6 new	Do.	Without certificates.
Saddleworth	All	New	Stat. min. really 1*s.* 6*d.*	Only certified cases.
Sedbergh	None	—	Stat. min.	Do.
Selby	All	New	Do.	Without certificates.
Settle	All	Do.	Do.	Do.
Sheffield	All	Do.	Do.	Do.
Skipton	All	Do.	Do.	Do.
Tadcaster	All	Do.	Do.	Do.
Thorne	All	Do.	Do.	Do.
Wakefield	None	—	Do.	Only certified cases.
Wetherby	All	New	Do.	Without certificates.
Wharfedale	All	Do.	Do.	Do.
Wortley	1 out of 3	Do.	Do.	Only certified cases.
Altrincham	All	1 old, 6 new	Do.	Do.
Birkenhead	All	New	Do.	Do.
Boughton, Great	2 out of 3	Do.	Do.	Without certificates.
Chester	All	Old	1*s.* 6*d.*	Do.
Congleton	All	New	Stat. min.	Do.
Macclesfield	All	1 new, 3 old	1*s.* 6*d.*	Do.
Nantwich	7 out of 8	New	Stat. min.	Do.
Northwich	All	Do.	2*s.* and 3*s.*	Only certified cases.
Runcorn	All	Do.	Stat. min.	Without certificates.
Stockport	Could not be found	—	Do.	Only certified cases.
Wirral	All	New	Do.	Do.
Ashton-under-Lyne	11 out of 12	New	Stat. min.	Without certificates.
Barton-upon-Irwell	All	Do.	Do.	Do.
Blackburn	3 out of 9 only could be found.	Do.	Do.	Do.

APPENDIX.

TABLE G.—*continued.*

Nos. 1-4. *Local Inquiries as to Vaccination.*	Union.	Public Vaccinators under Contract.	Dates.	Terms paid.	Practice as to payment.
3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.	Bolton	All	New	Stat. min.	Without certificates.
	Burnley	All	Do.	Do.	Do.
	Bury	All	Do.	Do.	Do.
	Caton (Incorporation)	None	—	Do.	Do.
	Chorley	All	Do.	Do.	Do.
	Chorlton-upon-Medlock	All	Do.	Do.	Do.
	Clitheroe	All	Do.	Do.	Do.
	Fylde	All	Do.	Do.	Do.
	Garstang	All	Do.	Do.	Do.
	Haslingden	All	Do.	Do.	Do.
	Lancaster	All	Do.	Stat. min. In one district, 2s. and 2s.6d.	Only certified cases.
	Leigh	All	Do.	Stat. min.	Without certificates.
	Liverpool	None	—	1s.6d. only	Only certified cases.
	Manchester	All	Do.	Stat. min.	Without certificates.
	Oldham	All	Do.	Do.	Do.
	Ormskirk	3 out of 5	1 new, 2 old	Do.	Do.
	Prescot	None to be found	—	Do.	Do.
	Preston	All	New	Do.	Do.
	Prestwich	All	Do.	Do.	Do.
	Rochdale	2 out of 7	1 new	1 at 1s.6d., 1 at stat. min.	Do.
	Salford	All	New	Stat. min.	Do.
	Todmorden	1 only could be found out of 5.	New; the other 5 old.	1s. 6d.	Do.
	Toxteth Park	1 out of 2	New	Stat. min.	Do.
	Ulverstone	All (?)	Do.	Do.	Only certified cases.
	Warrington	3 out of 6	Do.	Do.	Do.
	West Derby	11 out of 13	5 new, 6 old	Do. Uniform 1s.6d.	Without certificates.
	Wigan	All	New	Stat. min.	Do.
	Cockermouth	4 out of 5	Do.	Do.	Do.

c. Public Notice.

Means of affording to the people information concerning the times and places whereat vaccination can be had are much neglected. The 16 & 17 Vict. c. 100. enacts that the guardians "shall take the most "effectual means for giving from time to time to all persons resident" (in the several vaccination districts) "due notice of the days and hours "at which the medical officer or practitioner contracted with for such "purpose will attend at such place to vaccinate," &c. &c. How this has been done in the unions visited will appear on consideration of the following table (*Table H.*), in which the practice in each union in respect to the giving public notice is set forth. In the same table information is also given of the absence or frequency of any proceedings to enforce vaccination. From that table it appears that in 61 out of the 79 unions inspected no effort whatever has been made to enforce by legal measures compliance with the so-called Compulsory Act. This Act laid down no method by which proceedings against recusancy should be instituted or regulated. This defect was somewhat remedied by the enactment in 1861 of the Vaccination Acts Amendment Act, by which there is given to boards of guardians the power to nominate an officer to take the necessary proceedings, and there is a provision that the expenses of such, if duly certified by the convicting magistrates, shall be defrayed out of the common fund of the union. In some few unions this enactment has been taken advantage of, and the proceedings adopted have had the best results, in reducing the opposition to or neglect of vaccination. This has been the case especially in the Lancaster, Leeds, Northwich, Manchester, and Ulverstone unions. In some other unions great difficulties appeared to oppose themselves

to the success of any such legal measures. In Halifax union, for instance, the clerk stated that no proceedings had been taken, and he assured me that none would be attempted, because there was no possibility of proving the service upon the parent of the notice required by the 16 & 17 Vict. c. 100. to be given to the parent or person having the custody of the child on registering its birth, inasmuch as no copy was retained; therefore the service of an exact form of notice could not be sworn to. This has not been held to be a bar to proceedings in the great majority of unions in which proceedings have been attempted. In Chorley union one of the public vaccinators had instituted proceedings in three cases; but it appears to be very unadvisable that a medical practitioner should undertake such a duty. Such a practice would tend to a mischievous rather than a satisfactory result. In the Garstang union some people had been proceeded against, and compelled to have their children vaccinated, they having been operated on previously by an unqualified person, and therefore no legal certificate of vaccination could be produced. The re-vaccinations were not successful. In Liverpool, proceedings had been taken on several occasions; but it was found that the magistrates took every conceivable objection, and quashed them if possible. The registrars had had great difficulties to contend with in proving that the person to whom the notice was given was the parent, or that the person summoned was really the person who had received the notice. Again, it has been held by magistrates in several unions that as the mother had received the notice, the father being absent from home some distance, at work on a railway or in a mine, that no conviction could be had, because the father would be liable to the fine and he might be assumed to have been ignorant of his liability in the matter. In the Warrington union no proceedings had been taken, and the clerk distinctly stated that he felt sure that his board would not authorize any proceedings or in fact give public notice in the way suggested. No public notice had been given since 1859. No proceeding had been taken in the Wirral union. The clerk objected to the principle of coercion, and expressed himself very energetically in opposition to any attempt at such a proceeding. In Wetherby union, in which small-pox was rife at the time of my inspection, a person had recently been fined 20*s.* and costs, and he was ordered to have his child vaccinated within 14 days, or in default another summons would issue; and the magistrates had expressed their determination to inflict another penalty to the full amount in case of continued opposition.

TABLE H.

Union.	Public Notice given.	Proceedings taken.	REMARKS.
Barnsley	Lately	Frequently.	—
Barwick (Incorporation.	Never	None.	—
Bierley, North	Not since 1853	None.	—
Bradford	Not until small-pox lately	None.	—
Bramley	Just given (small-pox)	None.	—
Carlton (Incorporation.	Never	None.	—
Dewsbury	Lately (small-pox)	None.	—
Doncaster	None since 1853	None.	—
Ecclesall Bierlow	None for 4 or 5 years (small-pox.)	?	—
Goole	None since 1853	None.	—
Halifax	Lately (small-pox)	None	Not taken, because service of a true copy of notice could not be sworn to.

APPENDIX.

TABLE H.—*continued.*

Nos. 1–4. *Local Inquiries as to Vaccination.*

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

Union.	Public Notice given.	Proceedings taken.	REMARKS.
Hemsworth	Never	None.	—
Holbeck	Not since 1853	None.	—
Huddersfield	None for 5 years	None by guardians; once by registrar.	—
Hunslet	Never	None.	—
Keighley	Once a year	None.	—
Knaresboro'	None since 1853	None.	—
Leeds	Frequently	In all cases of default.	The results of all successful proceedings were printed on the forms of public notice.
Ouseburn, Great	None since 1853	None.	—
Paisley Bridge	Never	None.	—
Penistone	Only in 1857	None.	—
Pontefract	Never	None.	—
Preston Great (incorporation).	Never	None.	—
Ripon	None since 1854	None.	—
Rotherham	1853 and last month (small-pox).	None.	—
Saddleworth	1853; not since	None.	—
Sedbergh	None since 1849	None by guardians; by registrar, once successfully.	—
Selby	Not since 1853	None.	—
Settle	Lately (small-pox	None.	—
Sheffield	Frequently	None.	—
Skipton	Lately (small-pox)	None.	—
Tadcaster	Never	None	New union.
Thorne	1853, and two years since	None.	—
Wakefield	Never	None.	—
Wetherby	Very fairly	Yes.	—
Wharfedale	Never	None.	—
Wortley	Lately, and 2 years ago	None.	—
Altrincham	Lately (small-pox)	None	—
Birkenhead	Twice since 1861	None	Union only formed in 1861.
Boughton, Great	None since 1853	None.	—
Chester	Never	None.	—
Congleton	Never	None.	—
Macclesfied	None since 1853	None.	—
Nantwich	Lately only	None.	—
Northwich	Never since 1853	Frequently.	—
Runcorn	Never since 1853	None	The public vaccinator lately sent the bellman round to warn the people.
Stockport	4 months since (small-pox)	None.	—
Wirral	None for 2 or 3 years	None.	—
Ashton-under-Lyne	1853, and lately (small-pox) perhaps once between.	None	Many people were known who resisted the law.
Barton-upon-Irwell	1853, and lately (small-pox)	None.	—
Blackburn	Never since 1853	Once, 5 years ago.	—
Bolton	1853, 2 or 3 years ago, and lately.	None.	—
Burnley	1853 and lately (small-pox)	A few cases with great success.	—
Bury	In some districts lately	—	—
Caton (incorporation)	None since 1853	None.	—
Chorley	Yearly	None by guardians; medical officer had acted once.	—
Chorlton-upon-Medlock.	Never since 1853	None.	—
Clitheroe	Never	None.	—
Fylde	Never since 1853	None.	—
Garstang	None for several years	None since 1861.	—
Haslingden	Lately	None by guardians; once by registrar.	Notice had never been given until they received intimation of the inspection.
Lancaster	Constantly	Repeatedly.	—
Leigh	Yearly	Several times.	—
Liverpool	About every 6 months	Several times.	—
Manchester	Very well	None by guardians; twice by public vaccinator.	—

Union.	Public Notice given.	Proceedings taken.	REMARKS.
Oldham	Lately (small-pox), and 4 or 5 years before.	None.	—
Ormskirk	No new notice since 1853	None.	—
Prescot	Lately only (small-pox)	None.	—
Preston	1853 only	None.	—
Prestwich	Every 2 or 3 years	None.	—
Rochdale	1853 and 1862	None.	—
Salford	1853, and twice since (small-pox).	None.	—
Todmorden	1853 only	None.	—
Toxteth Park	Lately (small-pox)	None.	—
Ulverstone	Very well	Frequently.	—
Warrington	In 1859 only	None.	—
West Derby	Lately (small-pox), not for 3 or 4 years before.	None.	—
Wigan	None since 1853	None	Notice had been given in Hindley district in 1861, but in no other.
Cockermouth	Never	None.	—

d. Contractors and deputies.

The contractors were without exception legally qualified to vaccinate, but a great many of them had unqualified assistants who vaccinated for them. These often had no qualification whatever, and were almost always without proper qualification to act as deputy-vaccinator. In no instance had the terms of the Privy Council order in respect to deputies been complied with. The guardians had not acknowledged such deputy vaccinators, though in many cases the whole of the vaccination was delegated to these assistants.

e. Ages at which subjects are brought for vaccination.

The vaccination, in a great majority of the districts visited, was that of very young children, and only a few appeared to have been vaccinated after they had attained one year of age. Table A. gives a view of the relative amount of older to infant vaccination in all the unions visited. Very few re-vaccinations had been done anywhere. The feeling that three months was full early to insist on vaccination was very common, and in many districts removed from large towns the public vaccinators were in the habit of deferring vaccination until the child was nearly 12 months old.

f. The actual arrangements for vaccination adopted by public vaccinators.

In no union visited were the contracted-for arrangements literally complied with. The plans adopted were either to vaccinate from house to house; to perform the operation at the surgery, or at any other station, when demanded; or to start vaccination in some healthy child, and to assemble children at some convenient spot that they might be vaccinated from the recent arm. Where this practice prevailed there was a marked improvement in the quality of the vaccination. But this assembling of children by the public vaccinator is a work of considerable difficulty; and as he can rarely afford time to enable him to completely finish the vaccination of a district, many escape this necessary protection; and, again, the performance of this duty of hunting up cases by the doctor is productive of bad results. The people think that the public vaccinator does the work from interested motives alone, and they hold back instead of giving a ready acquiescence; or they insist on having their children vaccinated as they choose to dictate, rather than allow the public vaccinator to exercise his judgment in the matter. It is a common observation made by public vaccinators, that they beg to be allowed to vaccinate a

3. In Yorkshire, Lancashire, Cheshire, and Cumberland, by Dr. Stevens.

child thoroughly (causing four or more vesicles, as is found to be necessary, to secure the greatest amount of protection); but the mother insists that the operation should be done as she dictates, or not at all, and in a great proportion of cases it is so done.

g. Medical registers, and the way in which they are kept.

The form of the medical register of vaccination is very faulty. It is not worthy of the name of register. It is kept as an account book between the guardians and the public vaccinators. The orders of the Privy Council in respect to keeping these registers had not been complied with in any of the unions visited. In some unions no registers were kept by the public vaccinators, as in Blackburn, Liverpool, and Lancaster, and the Barwick and Carlton incorporations. An amended form of register is much needed; one in which the mode of operation, and the results of each vaccination, or attempt at vaccination, should be carefully recorded. This would also answer the purpose now served by the book at present in use, and it might be made by the guardians a sufficient check, and thus reduce the work in some unions expected of the public vaccinators, who have to send in, in addition to their so-called registers, certain monthly lists of all the vaccinations, as well as once a quarter a bill distributing to the several parishes or townships of the district the cases successfully vaccinated during that period.

h. Registrars.

The sub-district registrars in the unions visited, as a rule, performed their duties in respect to public vaccination with great regularity; I should say with uncommon assiduity. They are the most valuable aids in the promotion of vaccination, and they can work in the cause with far greater freedom and with more propriety than can the public vaccinators. The people look upon the registrars as the authorized instruments of the law; whereas they often openly accuse an importunate contractor of interested motives; of desiring to do as much vaccination as possible to increase his emolument. There is no such feeling against the registrar; therefore it is that vaccination flourishes in those districts in which the registrar looks well after the people; and this he does where he gets paid for his work. The payment the registrars are entitled to for their work in respect to public vaccination is by all considered far too low. Many registrars have stated that since the Act of 1853 placed these extra duties on them they have found their office of registrar hardly worth holding. This has been in districts in which they obtained a fair proportion of certificates from the vaccinators, without which they get no payment at all, although they are, whether they receive any payment or not, bound to keep up their register, making in it nine entries for every birth they register.

It is often the case that a registrar, owing to the neglect or opposition of medical practitioners, receives none or only a very small proportion of his expected certificates. He then either works at a loss, usually the case, or he neglects his duties, and public vaccination in that district loses its best promoter. In the course of my inquiry I ascertained that the registrar for the populous district of Rotherham in the Rotherham union had made no entry in his register for two years, because, as he stated, he had received no certificates during that time.

In one of the districts of the Warrington union the registrar, who had been recently appointed, produced a book, in which had been made no entry whatever. He stated that his predecessor, who had held office for some years, had never kept a register at all. They had received no

certificates. In the very populous district of Broughton in the Salford Union the registrar had kept no register at all until just before the inspection, owing to the same cause.

One of the registrars of the West Derby union had ceased to keep his register since 1857, and another since 1860, because they had received no certificates. In the Holbech and Hunslet unions the guardians had recognized the injustice of exacting work from the registrars for which they could not get uniform payment, and the boards had adopted the practice of paying the registrars for each entry they made in their registers after registering a birth, whether they received a certificate of successful vaccination or not. This plan, though relieving the registrars from their unfair position, tended directly to make them careless of the most important part of their duty in respect to vaccination. In one union (Hemsworth) the registrar had made no entry in his register since 1861. The clerk paid him for the duplicate certificates he produced, and not for their entry in the register. He received his fair proportion of certificates.

i. Workhouses.

In thirteen of the unions visited there were either no workhouses or the workhouse children were inspected at the national schools. In 66 workhouses 4,057 children were examined, and as a rule they were very indifferently protected. Although it is the duty of the master of a workhouse to report weekly to the guardians the number of unvaccinated children in the house, I found in several that more than 30 per cent. of those inspected had not been vaccinated at all. In Dewsbury workhouse 38 per cent. were unvaccinated, Chorley 36 per cent., Chester 35·4 per cent., in Wigan and Leeds upwards of 32 per cent., in Selby, Barton-upon-Irwell, and Holbeck upwards of 30 per cent., and in 13 others considerably more than 20 per cent. were still waiting for this protection.

When it is borne in mind that on the appearance of small-pox in a district the workhouse is certain to be the earliest refuge, it does appear infamous that the authorities entrusted to so great an extent with the care of the public health and in whom are vested such extensive powers, should permit such gross negligence within their very walls.

As mentioned in my last report, the chief excuse made for this neglect is that the population of the union house is so liable to fluctuation and change that children escape observation. This is no excuse, but should be an incentive to still greater vigilance on the part of the officials. Moreover, it is the duty of an officer in the house to examine and report on the matter. I found in most workhouses that the weekly reports were made to the effect that there were no unvaccinated children in the house; the real state of things being as I have described above.

In some unions the payment for workhouse vaccination is still included in the medical officer's salary. Not being paid per case, he becomes careless about the matter. This was the practice in Doncaster, Selby, Sheffield, Chester, Congleton, Bradford, and some other unions.

k. Small-pox.

Unhappily small-pox was present in an epidemic form over a large portion of the area visited; throughout the greater portion, except the extreme north, of the West Riding of Yorkshire, and in some of the larger towns in Lancashire. In Table I. I have enumerated the unions that have been the chief sufferers from small-pox during the late epidemic.

TABLE I.

TABLE showing Districts in which the greatest amount of Small-pox occurred in last Epidemic (1861, 1862, and 1863).

Union.	District.	Estimated Value of Vaccination. Perfection being 1,000.	Population in 1861.	Commenced.	Imported from.	Estimated Number of Cases.	Remarks at Time of Inspection.
Barnsley	Barnsley	183	23,198	Sept. 1862	Chesterfield	250	Epidemic increasing.
Bierley, North	Shipley	377	12,589	March 1861	Bradford	300	Ditto continuing.
Bradford	Bowling	335	14,495	Jan. 1861	..	Several hundreds	Ditto ditto.
Bramley	Bramley	209	..	May 1862	Bradford	Ditto	Ditto increasing.
Holbeck*	The Township	263	15,824	June 1862	..	Ditto	Ditto continuing.
Huddersfield	Ditto	235	34,874	June 1862	Bradford	Ditto	Ditto ditto 83 deaths already.
Keighley†	Bingley	233	12,204	Nov. 1862	Ditto	500	Ditto increasing.
Leeds	The Township	208	117,566	Jan. 1863	Holbeck	250 cases in 4 months	Ditto continuing.
Ousebourn, Great	Green Hammerton	469	359	June 1862	York	60	Ditto lasted 6 months; none now.
Penistone	Silkstone	266	2,937	June 1861	Huddersfield	Some dozens in last 4 months	Ditto continuing.
Ripon‡	Ripon	191	8,023	Feb. 1863	York	400 in 3 months	Ditto ditto 17 deaths already.
Sheffield	Brightside§	325	29,831	Sept. 1862	..	Several hundreds	Ditto continuing.
Skipton	Skipton	248	8,056	Dec. 1862	Burnley	More than 100	Ditto ditto.
Ditto	Barnoldswick	224	5,528	Dec. 1862	Ditto	More than 150	Ditto ditto.
Wetherby	Wetherby	228	..	Nov. 1862	York	More than 200	Ditto increasing.
Wortley	Ecclesfield	253	5,406	March 1863	Burnley	More than 100 in 3 months	Ditto rapidly spreading.
Blackburn	Blackburn	236	46,411	Feb. 1863	Ditto	300 or 400	Ditto continuing.
Burnley	Burnley	194	21,469	Jan. 1861	..	Some hundreds	No cases now.
Bury	Bury	326	30,399	Oct. 1863	Burnley	Some dozens	Epidemic just commenced.
Clitheroe	Clitheroe	198	9,744	Feb. 1863	Ditto	Upwards of 300	No case now.
Prescot	St. Helens	174	20,485	Oct. 1863	Wigan	Some dozens	Epidemic just commenced.
Warrington	Newton	246	10,956	July 1863	Manchester	Some hundreds	Ditto spreading.
Wigan	Wigan	186	31,939	July 1863	Ditto	Ditto	Ditto ditto.
Chorlton-on-Medlock	Hulme, No. 1.	176	27,000	March 1863	Ditto	Several hundreds	Ditto ditto.
Ashton-under-Lyne	Mottram, &c.	260	7,255	March 1863	Ditto	Ditto	Ditto cases now.
Ditto	Ashton	200	43,140	Feb. 1863	Ditto	300	Ditto some now.
Oldham	Oldham	203	52,818	Oct. 1862	Ditto	300 or 400	Ditto continuing.
Prestwich	Cheetham	184	25,659	Sept. 1862	Ditto	200 or 300	Ditto ditto.
Altrincham	Altrincham	258	6,628	March 1863	Ditto	More than 100	Ditto still spreading.
Ditto	Ashton-on-Mersey	181	6,793	April 1862	Ditto	—	—
Stockport	Marples	169	8,578	August 1863	Ditto	About 100	Ditto spreading fast.
Cockermouth	Cockermouth	169	13,141	July 1863	Whitehaven	Ditto	Ditto spreading.
Ditto	Keswick	180	5,723	July 1863	Cockermouth	Some scores	No fresh cases.

* Of 88 deaths by Small-pox which had been registered in the Township of Holbeck from 1841 to the present year 71, had occurred in unvaccinated persons, and in two cases it was doubtful whether or not the operation had been performed.

† The Bingley district relieving officer's relief book showed that 62 applications for relief had been caused in the first three months of the year by Small-pox alone; most of these were heads of families, several members of which had the disease simultaneously.

‡ In Ripon 27 heads of families had been relieved in three months on account of Small-pox.

§ In Brightside a family of five who resisted vaccination were all down with Small-pox at the time of the inspection; one had already died.

I could not help observing the carelessness evinced by the public generally and also by the authorities in allowing the exposure in public places of infected persons, in permitting the too early return to schools of convalescent children, and the entire absence of proper provision for the treatment of small-pox cases in appropriate buildings, apart from healthy people, or those suffering from other non-contagious ailments.

There was equal want of forethought as to means of removal of persons suffering from the disease. I could quote many instances that were brought to my notice of persons who had clearly taken the disease after having ridden in a public vehicle that had been used for the conveyance of small-pox patients.

The following tabular statement of the condition as to vaccination, and the results of 68 cases of small-pox treated in the Leeds House of Recovery during the late epidemic up to May 1863 affords one of the many proofs I have met with of the protective value of efficient vaccination.

Whether vaccinated.	Form of Disease.	Result.
Vaccinated, 27	V. Discreta, 25 V. Confluens, 2	Recovered, 27.
Not vaccinated, 27	V. Discreta, 13 V. Confluens, 14	Recovered, 13. Recovered, 7. Died, 7.
Said to have been vaccinated in infancy, but have no marks 5	V. Discreta, 0 V. Confluens, 5	— Recovered, 3. Died, 2.
Not ascertained, 9	V. Discreta, 5 V. Confluens, 4	Recovered, 5. Recovered, 3. Died, 1.

Remarks.

1. It appears to be essential that the law should be so amended that nothing like a permissive character should attach to any measure which the Legislature esteems to be not only nominally but essentially compulsory.

2. Experience compels to the belief that the guardians of the poor are not either efficient or suitable authorities for the administration of the Vaccination Acts.

3. By amendment of the law the quantity of vaccination may be rendered complete; but it is the almost universal opinion of clerks to guardians, public vaccinators, registrars, and even guardians, that the local authority, whatever that may be, can never have at its disposal a sufficiently independent officer (except where there are officers of health) to secure efficiency in quality, which can only be attained by constant inspection.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

4.—DR. SANDERSON'S SUMMARY of the RESULTS of his INQUIRY in certain UNIONS in GLOUCESTERSHIRE, SOMERSETSHIRE, and DEVONSHIRE.

The enquiry related to 32 unions, viz., 13 in Gloucestershire, 9 in Somersetshire, and 10 in Devonshire.

The following Table exhibits the names of the unions inspected, the number of vaccination districts and of public vaccinators, the proportion which the number of vaccinations bore to that of the births registered during the three years ending Michaelmas 1862, and the number of children without marks of vaccination found in every 100 children examined in each union :—

TABLE I.

No.	Union.	Number of Vaccination Districts.	Number of Vaccinators.	Number of Infantile Vaccinations in Proportion to every 100 registered Births.	Number per Cent. of Children examined without Marks of Vaccination.
1	Bristol	5	7	57·5	10·7
2	Chipping Sodbury	4	5	49·8	12·7
3	Cirencester	4	3	44·2	8·8
4	Clifton	6	6	46·7	11·4
5	Dursley	3	3	39·5	18·9
6	Newent	3	3	38·0	8·7
7	Northleach	5	5	66·9	11·1
8	Stow-on-the-Wold	3	3	38·3	18·8
9	Stroud	6	5	48·7	8·1
10	Tetbury	2	2	33·5	18·8
11	Thornbury	3	3	63·9	7·1
12	Westbury-on-Severn	3	3	45·2	15·7
13	Wheatenhurst	2	2	69·2	5·1
14	Axbridge	11	17	56·8	8·7
15	Clutton	5	5	55·8	6·7
16	Dulverton	4	4	89·3	8·6
17	Frome	5	5	59·0	7·8
18	Keynsham	5	4	57·5	8·8
19	Shepton Mallet	5	5	50·0	9·2
20	Wells	4	4	49·8	13·5
21	Williton	7	7	49·1	11·0
22	Wincanton	6	6	55·4	8·4
23	Barnstaple	11	10	57·3	16·1
24	Bideford	6	6	40·4	10·5
25	Crediton	11	9	67·5	8·0
26	Holsworthy	5	5	72·1	4·7
27	Newton Abbot	14	12	33·1	16·5
28	Plympton	6	6	70·4	5·5
29	St. Thomas	16	15	56·6	11·4
30	South Molton	10	8	70·8	7·9
31	Tiverton	15	11	41·3	20·8
32	Torrington	6	6	24·0	16·9
	Total	199	195	—	—

I.—PUBLIC ARRANGEMENTS.

Contracts.

Contracts approved by the Poor Law Board exist in 28 of the unions inspected; in 25 there is a contract for each district, in three there are contracts relating to some of the districts only. In three unions the guardians have omitted to enter into any contract, viz. in Cirencester, Barnstaple, and Holsworthy; in Stroud union the guardians executed

contracts with all their medical officers in 1858, but as they did not receive the sanction of the Poor Law Board, they are inoperative.

In all of the unions in which there are contracts, the contractors are required to attend either at their surgeries or at the appointed stations periodically. But as in many instances daily attendance at the contractor's residence is all that is stipulated, it may be readily understood that the requirement is often of no practical importance.

Of 143 districts in which contracts exist, the stipulations relating to times and places appointed for vaccination are completely maintained in 33, partly maintained in 27, and entirely disregarded in 83. All of the unions have been divided into vaccination districts, and with the following exceptions, the medical relief districts have been adopted for vaccination. Bristol Incorporation Union is divided into six districts for vaccination, but into five for other medical purposes. In Axbridge Union each of the medical officers has been appointed public vaccinator in his own district; but, in addition, other medical practitioners have been contracted with, for particular parishes or for the whole union. In Keynsham Union a similar arrangement has been made as regards the parish of Bitton.

Division of unions into districts for vaccination.

It was found that no less than 13 of the contractors do not possess the qualifications required by their Lordships' regulations. In one instance a contractor who was admitted to practice after the 1st of January 1860, has not obtained the special certificate relating to vaccination. Four of the contractors are licentiates of the Society of Apothecaries, but possess no other qualification; two are members of the College of Surgeons only; six derive their authority to practise medicine from bodies which are not recognized by the Poor Law Board, of whom two are members of the College of Surgeons.

Qualifications of Contractors.

Assistants are employed in vaccination in 18 districts; of these ten are qualified medical practitioners, while eight are unqualified. None of them have been admitted as deputies under contract.

Registers are kept by the contractors in all of the unions inspected, excepting that of St. Thomas. 163 registers were examined in the course of the inspection; it was found that in 151 the entries in the principal columns were regularly made. In nine of the registers the age of those vaccinated was very frequently omitted, and in two it was stated as being over or under one year. In 115 registers no record was kept of unsuccessful operations. The source from which the lymph employed in each vaccination was obtained was recorded in 13 registers, namely, by five of the contractors of Bristol Union (the guardians of which have lately introduced a new form of register in accordance with the recommendations of the Privy Council), by four of those of Wincanton Union, and by individual contractors in other places. In five of the registers only were re-vaccinations distinguished from others.

Contractors' Registers.

In 20 of the 32 unions inspected, the annual returns are founded on the vaccination registers, which are sent in periodically with the contractor's claims for payment. In one union they are founded on duplicates of the registers called "monthly returns," which the contractors are required to furnish, in addition to their other duties.* In six unions the annual return for each district is prepared by the contractor irrespectively of the vaccination charges, the return for the whole union being a mere compilation of those furnished by each vaccinator. When this method is followed, the results are more likely to be wrong than right, as there is no attempt at verification. In five

The annual returns to the Poor Law Board are usually prepared in the clerk's office from the contractors' registers.

* In this union the contractor is expected to enter every case six times before he is entitled to claim his 1*s.* 6*d.*

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

unions only did it appear to me that the method adopted in the preparation of the annual returns was such as to afford ground for regarding them as reliable documents, worthy of implicit dependence, viz. in Wheatenhurst, Thornbury, Barnstaple, Crediton, and St. Thomas. In Wheatenhurst and Thornbury a form, shown below, is provided by the guardians. Each contractor is required to use this form in making his half-yearly claim for vaccination. When filled up it not only answers the purpose of a bill, but contains the numbers of vaccinations at the required ages stated in the precise order in which they are wanted for the annual return, with this immense advantage that their accuracy is guaranteed; for in a document on which a claim for payment is founded, it may be regarded as tolerably certain that nothing will be omitted by the claimant, nor is it likely that any interpolation will be passed over by the guardians. The form employed in Wheatenhurst Union is headed as under:—

In some unions they are based on the contractors' charges for vaccination.

WHEATENHURST UNION.

Vaccination Account for the_____District.

Half-year ended_____186 .

PARISHES.	Numbers Vaccinated.			*Successfully Vaccinated.*			FEES.
	Under 1 Year.	Above 1 Year.	Total.	Under 1 Year.	Above 1 Year.	Total.	

II.—DUTIES OF REGISTRARS.

The Divisions of the Unions for registration

The 32 unions inspected are divided into 127 registration districts. The limits of 36 of the districts coincide with those of the districts for vaccination; in 31 of these instances the districts are identical; in the other five, each registration district comprises either two or three vaccination districts.

Register of successful vaccination.

The register of successful vaccination is regularly kept by 104 registrars, with the exception that 35 of them omit to enter the names of children who die or leave the district before the registration of birth. In six districts the register is kept in an improper manner, the entries not being made on registration of birth, but on the receipt of the duplicate certificate of vaccination. In the remainder of the districts no register is kept.

Delivery of notice.

122 of the registrars profess to deliver the notice of the requirement of vaccination regularly; in the remaining five districts the practice has been discontinued.

Announcement of times and places appointed for vaccination.

In 73 districts the schedule of the notice is filled up by the registrar in accordance with Schedule A. annexed to each contract; in 35 at least of these the arrangements of times and places for the performance of vaccination are obsolete and inoperative; in the remain-

der they are more or less carried out by the contractors. In 21 districts the registrars announce arrangements which are at variance with the contracts; in 11 instances the arrangements announced are said to be in operation, while in the remaining 10 they are obsolete. Five registrars confine themselves to announcing the contractor's name; two insert his name and place of vaccination, without stating the times of attendance; the remaining 21 registrars make no announcement, leaving the schedule of the notice blank.

Two of the registrars have taken proceedings for the enforcement of vaccination. In the town of Bideford, in consequence of the prevalence of small-pox in 1859, the registrar made a house to house visitation of the streets inhabited by the poor, and prosecuted five persons found to have neglected the vaccination of their children, most of whom were convicted and fined. In Shepton Mallet the registrar having several times incurred the expenses of unsuccessful prosecution, has declined to interfere further.

Efforts made by the registrars to promote vaccination:

Proceedings before Justices.

Lists of unvaccinated children have been furnished to the contractors by 52 of the registrars.

Parochial lists.

Thirteen of the registrars are also public vaccinators, of whom four keep no "register of successful vaccination," but all profess to deliver the vaccination notice on the registration of birth. Three registrars are medical practitioners, but not contractors; two of these gentlemen perform none of the duties of their office relating to vaccination.

Registrars, who are also public vaccinators.

III.—Quantity of Vaccination.

TABLE II.—*Showing the Numbers and Ages of those Vaccinated in each District, and the Number of Children without Marks of Vaccination in the Schools.*

Name of Union.	Name of District.	Population.	Average annual Number of Vaccinations returned to the Poor Law Board for the Three Years ending September 29, 1862.	Proportion of the annual Number of Vaccinations to every thousand of the Population in 1861.	Proportion of the annual Number of Infantile Vaccinations to every thousand of the Population in 1861.	Number of duplicate Certificates annually received by Registrars.	Number of Children without Marks of Vaccination in every Hundred examined in the Schools.
GLOUCESTERSHIRE.							
Bristol	St. Mary, Redcliffe	14,335	334	20·8	17·9	201	11·5
	Castle Precincts	10,194	153			107	
	St. Paul	15,775	367			289	
	St. James	10,325	178			163	
	St. Augustine	15,398	341			394	
Chipping Sodbury	Hawkesbury	4,155	53	12·7	9·8	37	12·4
	Chipping Sodbury	4,492	104	23·3	18·1	72	5·7
	Marshfield	2,363	28	11·8	5·9	29	23·5
	Wick and Abson	3,001	104	34·5	31·3	71	9·0
Cirencester	Central District	7,934	271	34·2	16·1	*	4·3
	Northern District	4,664	126	27·1	12·8	*	5·1
	Fairford	4,990	169	21·8	13·0	*	20·2
Clifton	Clifton	21,575	167	7·7	6·6	153	5·5
	St. Philip and St. Jacob	31,753	614	19·4	18·0	613	11·5
	St. James and St. Paul	16,750	718	42·8	15·7	133	19·5
	Westbury-on-Trym	5,340	104	18·9	16·4	37	10·9
	Winterbourn	3,822	62	16·7	9·9	62	11·9
	Stapleton	15,651	352	22·5	21·0	299	5·3
Dursley	Dursley	5,106	87	17·1	16·3	91	13·4
	Wotton-under-Edge	5,755	101	17·5	6·6	26	16·2
	Uley	2,471	17	6·9	3·6	2	39·0

* In this Union the registers of successful vaccination have not been kept. No returns were obtained from the Registrars.

TABLE II.—*continued.*

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

Name of Union.	Name of District.	Population.	Average annual Number of Vaccinations returned to the Poor Law Board for the Three Years ending September 29, 1882.	Proportion of the annual Number of Vaccinations to every thousand of the Population in 1881.	Proportion of the annual Number of Infantile Vaccinations to every thousand of the Population in 1881.	Number of duplicate Certificates annually received by Registrars.	Number of Children without Marks of Vaccination in every Hundred examined in the Schools.
GLOUCESTERSHIRE—*cont.*							
Newent	Newent	5,850	134	22·9	15·7	82	7·6
	Red Marley	3,473	68	19·6	16·1	57	11·6
	Dymock	3,098	47	15·1	8·6	51	7·9
North Leach	North Leach	2,083	78	31·5	27·1	57	8·2
	Sherborne	3,154	67	21·2	20·5	77	19·4
	Bibury	1,842	53	28·6	23·4	38	10·3
	Withington	2,228	74	33·2	20·5	33	26·7
Stow-on-the-Wold	Stow	4,191	49	11·7	6·4	16	22·1
	Bourton	3,022	60	19·8	17·5	38	17·5
	Longborough	2,464	59	23·8	16·5	56	5·3
Stroud	Stroud	11,232	207	18·4	15·7	207	8·1
	Stonehouse	5,516	81	14·6	13·2	61	3·8
	Horsley	4,409	126	19·0	7·3	64	7·3
	Minchinhampton	6,264	61	9·7	5·2	72	8·2
	Bisley	4,022	93	19·8	16·6	101	19·0
	Painswick	4,334	125	28·8	27·5	125	4·1
Tetbury	Tetbury	4,450	33	7·4	4·9	32	21·3
	Didmarton	1,662	47	28·3	22·8	44	7·9
Thornbury	Almondsbury	5,061	163	20·7	17·0	103	9·3
	Thornbury	6,080	143	23·6	21·8	126	4·6
	Berkeley	5,291	193	37·2	13·6	157	5·1
Westbury-on-Severn	Westbury	4,074	151	36·9	25·6	*	15·5
	Newnham	8,691	143	16·6	10·9	*	11·5
	Mitcheldean	7,163	197	27·5	17·3	*	18·0
Wheatenhurst	Wheatenhurst	4,566	87	19·1	13·6	70	6·3
	Frampton	3,244	104	31·3	30·3	100	2·8
SOMERSETSHIRE.							
Axbridge	Banwell	3,562	63	17·5	10·5	36	7·2
	Hutton	3,370	83	24·5	17·2	79	2·2
	Weston-super-Mare	8,031	156	19·4	11·6	137	8·4
	Churchill	810	13	16·1	9·1	0	15·0
	Wrington	4,590	136	25·3	19·7	*	7·0
	Axbridge	2,139	27	12·6	7·7	27	11·6
	Cheddar	2,915	53	18·2	9·1	58	6·2
	Wedmore	5,161	143	27·6	16·2	133	9·5
	Burnham	3,776	141	37·2	24·5	75	5·3
	East Brent	1,719	61	35·5	30·9	25	8·8
Clutton	Cameley	827	25	30·2	15·7	28	27·7
	Midsomer Norton	9,661	233	24·2	18·9	36	3·2
	Harptree	2,735	41	15·6	18·2	62	12·9
	Chew Magna	4,422	98	22·2	20·2	98	1·2
	Clutton	6,072	137	22·5	14·8	*	6·8
Dulverton	Dulverton	3,091	84	27·2	23·9	110	8·6
	Brompton Regis	2,247	64	28·2	27·8	69	†
Frome	Frome	12,545	210	16·7	14·9	192	3·7
	Beckington	3,773	89	24·9	22·2	70	†
	Kilmersdon	3,217	103	32·0	28·3	103	5·4
	Nunney	2,995	65	24·9	17·3	82	5·4
	Mells	1,762	56	20·4	18·1	29	14·2
Keynsham	Keynsham	4,585	58	13·6	11·1	72	8·6
	Corston	2,050	34	16·6	11·7	51	7·4
	Bitton	2,999	57	19·6	19·2	59	2·7
	Hanham	7,093	102	14·4	11·7	59	29·8

* No return was obtained from the Registrar.

† No school was examined in this district.

TABLE II.—*continued.*

Name of Union.	Name of District.	Population.	Average annual Number of Vaccinations returned to the Poor Law Board for the Three Years ending September 29, 1862.	Proportion of the annual Number of Vaccinations to every thousand of the Population in 1861.	Proportion of the annual Number of Vaccinations to every thousand of the Population in 1861.	Number of duplicate Certificates annually received by Registrars.	Number of Children without Marks of Vaccination in every hundred examined in the Schools.
SOMERSETSHIRE—*cont.*							
Shepton Mallet	Shepton Mallet	7,698	194	25·2	19·0	5	11·9
	Ashwick	3,773	24	6·4	3·2	23	13·3
	Ditcheat	1,218	34	28·0	22·2	24	5·5
	Evercreech	2,701	50	18·5	13·3	46	7·4
	East Pennard	1,322	45	34·0	30·2	19	0·0
Wells	St. Cuthbert In	6,239	114	18·2	9·6	17	21·3
	St. Cuthbert Out	5,013	95	18·9	10·1	34	11·6
	Glastonbury	5,235	99	18·9	12·4	34	13·8
	Butleigh	5,402	189	35·0	26·7	48	2·8
Williton	St. Decumans	5,670	75	12·6	6·4	6	13·2
	Dunster	4,233	59	13·8	9·6	6	21·4
	Stogumber	6,040	96	31·5	23·0	96	6·3
	Stogursey	2,677	92	34·4	23·2	92	4·6
	Porlock	1,176	39	33·3	26·5	0	3·7
	Minehead	2,299	44	19·1	10·0	0	4·4
Wincanton	Horsington	2,238	53	23·6	17·9	57	10·4
	Wincanton	5,126	123	24·0	21·4	30	3·1
	Bruton	3,969	70	17·6	10·1	57	13·2
	Queencamel	2,433	67	27·5	21·4	59	0·0
	Milborne Port	3,824	69	19·1	14·9	53	4·6
	Castle Cary	4,108	83	20·5	18·0	87	4·9
DEVONSHIRE.							
Barnstaple	Barnstaple	11,037	268	24·3	21·5	250	9·9
	Swymbridge	4,330	91	21·0	13·8	61	15·3
	Braunton	3,738	88	23·5	22·7	118	2·4
	Ilfracombe	5,543	106	19·1	10·3	94	25·0
	Combe-Martin	2,408	16	6·6	1·2	2	38·0
	Pilton	4,638	102	21·9	15·1	64	6·4
	Ignton	2,413	92	38·2	24·9	61	†
	Instow	1,214	32	26·2	9·8	0	0·0
Bideford	Northam	3,612	0	0·0	0·0	8	2·8
	Bideford	5 742	56	9·7	7·8	*	20·0
	Buckland	2,425	43	17·7	15·7	126	3·9
	Hartland	2,950	80	27·1	23·7	0	5·6
Crediton	Crediton	5,731	135	23·6	13·4	*	10·4
	Bow	3,466	88	25·4	8·6	58	7·3
	Newton St. Cyres	1,094	23	21·1	11·9	17	21·4
	Sandford	2,247	64	28·5	23·6	48	10·5
	Morchard Bishop	2,774	92	33·2	31·4	80	1·2
	Cheriton Fitzpaine	1,966	48	24·5	19·8	50	11·8
	Chawleigh	1,512	42	28·0	27·3	36	5·0
Holsworthy	Holsworthy	2,432	64	26·5	21·5	*	5·5
	Bradworthy	2,177	105	48·0	39·4	30	4·0
	Pyworthy	1,841	39	21·1	20·1	29	0·0
	Black Torrington	1,711	43	25·2	14·6	53	5·4
	Ashwater	1,712	60	34·7	29·0	*	†
Newton Abbott	Ashburton	5,532	126	21·7	13·5	0	18·5
	Broadhempston	1,035	9	8·9	5·9	0	2·5
	Ipplepen	1,218	22	18·1	12·3	0	†
	Newton Abbott	8,585	157	18·3	8·3	0	28·0
	Bovey Tracey	3,084	110	35·6	15·6	4	6·2
	Moreton Hampstead	2,718	61	22·4	17·3	54	5·2
	Chudleigh	2,680	52	19·3	9·6	0	26·9
	Dawlish	4,014	24	5·4	4·7	0	8·9
	Teignmouth	6,949	110	15·6	7·9	0	17·1

* No return was obtained from the Registrar.

† No school was examined in this district.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

4. In Glouces tershire, Somet setshire, and Devonshire, b Dr. Sanderso

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1. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

TABLE II.—*continued.*

Name of Union.	Name of District.	Population.	Average annual Number of Vaccinations returned to the Poor Law Board for the Three Years ending September 29, 1862.	Proportion of the annual Number of Vaccinations to every Thousand of the Population in 1861.	Proportion of the annual Number of Certificates to every Thousand of the Population in 1861.	Number of duplicate Certificates annually received by Registrars.	Number of Children without Marks of Vaccination in every Hundred examined in the Schools.
DEVONSHIRE—*cont.*							
Newton Abbott—*cont.*	Shaldon	2,193	31	14·2	4·1	8	6·2
	St. Mary Church	4,238	91	20·0	17·6	156	7·5
	Torquay	16,416	171	10·4	8·3	108	29·8
Plympton	Plympton	4,496	101	22·5	17·4	77	5·5
	Ivy Bridge	1,245	29	24·3	15·3	48	4·8
	Egg Buckland	5,532	159	28·7	22·8	130	4·0
	Ermington	2,748	30	17·3	10·9	35	9·1
	Yealmpton	2,900	126	43·4	16·9	75	7·5
	Plympstock	3,548	148	41·5	32·1	56	4·1
South Molton	North Molton	3,208	199	62·3	21·2	89	9·5
	South Molton	7,193	119	16·5	10·8	70	2·3
	Witheridge	2,263	52	23·1	16·4	26	10·0
	Chulmleigh	3,468	97	28·2	21·1	108	8·4
	Chittlehampton	2,069	63	30·5	23·6	73	5·3
St. Thomas	St. Thomas	10,083	221	21·8	16·7	194	5·5
	Kenton	2,621	73	27·7	18·2	59	10·0
	Woodbury	5,529	211	39·0	22·1	235	25·0
	Broadclist	4,264	98	23·0	12·4	86	18·2
	Christow	3,370	107	31·8	20·8	98	9·5
	East Budleigh	2,496	76	30·4	14·8	52	†
	Heavitree	4,799	59	12·5	8·7	84	27·0
	Littleham	3,904	129	33·1	14·9	126	6·8
	Lympstone	1,122	50	44·6	24·1	49	10·7
	Topsham	5,129	98	19·1	14·2	128	9·3
	Withycombe	2,145	49	22·8	12·6	32	†
Tiverton	Bradninch	1,949	46	20·5	9·2	29	33·5
	Thorverton	1,810	57	32·0	17·1	45	9·2
	Cullompton	4,229	150	34·5	20·5	169	15·2
	Halberton	4,065	83	20·9	16·5	30	14·5
	Sampford	1,164	13	11·2	7·7	15	†
	Silverton	3,514	44	29·1	13·2	28	22·2
	Tiverton	11,126	142	12·8	8·5	82	19·0
	Bampton	4,262	81	19·0	11·5	33	50·0
Torrington	Torrington	6,739	51	7·5	4·7	0	23·9
	Shebbear	1,893	34	18·0	12·2	0	0·0
	Winkleigh	1,423	60	42·0	18·9	17	21·7
	Dolton	4,229	19	4·5	2·3	0	17·0
	Little Torrington	2,597	62	23·8	12·4	0	10·8

† No school was examined in this district.

he causes on hich the tension of ccination pends vary cording to e nature of e district. town dis- ets a self- ing system y be suc- sful; t not in the untry.

The circumstances under which vaccination is performed in town and country are entirely different. In town districts, a self-acting system may be successfully employed. Certain facilities are offered, but no effort need be made by the vaccinator to induce the poor to profit by these opportunities. He must attend at his station on the appointed week-days, and leave the result to the good sense of parents, or the interference of the local authority. He cannot with due regard to professional duty "tout" or "solicit" for vaccination.

In the rural districts it is otherwise. The only efficient agency in inducing the people to have their children vaccinated is that of the contractor, for the efforts of the registrar are only valuable in so far as he co-operates with the contractor by furnishing him with the infor-

mation he requires. In towns the duty of the vaccinator consists in attending regularly at the appointed time and place, and in performing the operation properly and efficiently. In the country, although his contract imposes on him no further obligation, and frees him from all responsibility for the results, so long as he attends regularly at his stations, he knows that if he were to content himself with such literal discharge of his functions, not half of the children in his district would be vaccinated. To every man of ordinary prudence, leaving conscience out of the question, the protection of his district from small-pox must appear paramount to every other consideration, so that it need be no matter of surprise that contractors should grudge the time and labour which are involved in carrying out to the letter the stipulations of their contracts, when other methods and arrangements are in their judgment better adapted for the purpose.

As therefore in the existing state of things the agencies by which vaccination is extended in the country are so entirely different from those which are in operation in towns, that they cannot be compared with each other, I have again, as in my last report, stated the facts relating to them separately.

Rural Districts.

In rural districts personal supervision must be combined with systematic arrangements.

The numerical success of vaccination in rural districts depends on the degree and proportion in which the two elements of *system* (understanding by the term all systematic arrangements of times and places for vaccination), and *personal supervision* exist or are combined in the practice of the vaccinator. With reference to this fact, the districts in question may be advantageously divided into four groups.

Districts in which there is neither system nor supervision.

In those districts in which both elements are wanting, the contractor neither makes arrangements whereby the poor may be enabled to apply to him at times fixed by himself, nor visits them at their houses. In the unions I have inspected this year, I have met with scarcely any instances of this form of neglect, excepting where guardians had unwisely contracted with more than one performer in the same town, in which case it was rather advantageous than otherwise (provided that the real vaccinator did his work efficiently) that the supernumerary should neglect his obligations. On these districts, therefore, I need offer no observations.

Secondly, where there is supervision without system, the performance of vaccination is strictly domiciliary; the children are never assembled either in their parents' cottages or elsewhere, and consequently each operation is separately performed.

Thirdly, when the contractor is regular in his attendance at the appointed times and places, but takes no means of seeing that the people avail themselves of the facilities offered them, there is system without supervision.

Lastly, the best worked districts of all are those in which system and supervision are united. The children are assembled either at fixed places of meeting, at times appointed on each occasion by the contractor (although it may sometimes happen that a vaccinator finds the times appointed by the guardians convenient for his purpose), or at villagers' cottages selected according to circumstances.

Of the districts of 165 contractors, whose practice was ascertained with sufficient precision to admit of description, vaccination was performed on application at the surgery at indefinite times in two; strictly from house to house in 45; at stations at fixed times in 42; by cottage meetings in 43; and at school-rooms, pay-rooms, or

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other fixed places of meeting, in the remaining 33. Out of the districts in which the contractor visits from house to house for the purpose of vaccinating children on the spot, I have selected 21 in which this method is employed exclusively. In seven of these districts the returns show that the results are satisfactory as regards quantity, while most of the children examined in the schools appeared to have been well vaccinated, viz., in Sherborne, Horsington, Wincanton, Barnstaple, Buckland, Ashwater, and Witheridge. In five, viz., Bibury, Axbridge, Porlock, Swymbridge, and Winkleigh, the numbers of vaccinations annually performed are sufficient or even excessive. In the remaining districts the quantity of vaccination is defective. In three of these, its quality is satisfactory, viz., in Evercreech, St. Decumans, and Northam. In the rest, quantity and quality are alike defective, viz., Tetbury, Combe Martin, South Molton, and Torrington.

I. Districts in which the performance of vaccination is strictly domiciliary.

In the district of Sherborne (population 3,154, V.R. 21·2, I.V.R. 20·5, children examined 67, 10·4 per cent. unprotected), vaccination is performed entirely by an unqualified assistant. This gentleman vaccinates children with dry lymph stored on glasses "at such times "and places as suit his other engagements." From the Vaccinator's Register, it appears that about 27 per mille are vaccinated annually in most of the parishes.* The examination of the schools showed that although typical scars were observed in the majority, bad protection was indicated in 25 per cent. The defective scars were, no doubt, the results of careless and hurried attempts with dry lymph.—In the two districts which surround the town of Wincanton (Horsington, population 2,238, V.R. 23·6, I.V.R. 17·9, children examined 74, 10·4 per cent. unprotected; Wincanton, population 5,126, V.R. 24·0, I.V.R. 21·4, children examined 64, 3·1 per cent. unprotected), the vaccination is also done by the contractor's assistants, one of whom, a qualified practitioner, returns about 23 per mille of the population in all his villages; while the other (unqualified) who obtains the aid of the registrar, returns about 28 per mille. In the latter case, the performance of vaccination and inspection is regular in all the parishes, and the evidence of quality afforded by the schools is satisfactory.—In the rural districts surrounding the town of Barnstaple (population of the whole district 11,037, V.R. 24·3, I.V.R. 21·5, children examined 182, 9·9 per cent. unprotected) vaccination is probably complete, for although the rate for the whole district would indicate defect, it amounts to 34 per mille in the villages. In the town it is 22 per mille, that is to say, a little above the normal rate for a town of the size of Barnstaple when completely vaccinated (see Report for 1861, p. 89). The success of this contractor, whose school results are most satisfactory, must be attributed to the aid he obtains from lists furnished by the registrar.—In Buckland district (population 2,425, V.R. 17·7, I.V.R. 15·7, children examined 77, 3·9 per cent. unprotected) vaccination has recently been performed by the contractor's assistant (a student of medicine). During the years to which the table refers, vaccination was somewhat in arrear, but the assistant has since visited the whole district, guided by registrars' lists. I have reason to believe that both vaccination and inspection have been carefully performed.—In Ashwater district (population 1,712, V.R. 34·7, I.V.R. 29·0, no schools in the district,) precisely the same method is followed by the contractor. Vaccination and inspection appear to be well carried out, and the numbers regularly returned in each parish, are sufficient for the complete protection of the population. I had an opportunity

Although in most of these districts the results recorded were unsatisfactory, good vaccination was met with in a few instances.

a. The state of vaccination is satisfactory. Sherborne (Northleach). Horsington and Wincanton.

Barnstaple.

Buckland (Bideford).

Ashwater (Holsworthy).

* The tabular numbers are founded on the Returns to the Poor Law Board.

of examining the results in the school of the workhouse, of which the contractor is medical officer, and found them to be excellent.—Lastly, in Witheridge district (population 2,263, V.R. 23·1, I.V.R. 16·4, children examined 136, 10·0 per cent. unprotected), although the tabular rate is unsatisfactory, the more accurate numbers obtained from the registers show an equally favourable state of vaccination.

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

Thus, it appears that in the preceding districts, although the performance of vaccination was unrestricted, both as regards time and place, the unfavourable results which might have been anticipated were prevented by the use of proper methods of insertion, by due care in the collection and preservation of lymph, and by regular inspection. It is worthy of remark, that the numerical success of vaccination in many of these districts, is more or less attributable to the use of registrars' lists, and that in several of them the population is so scattered that it would be difficult or impossible to assemble the children in considerable numbers.

Witheridge (South Molton).

6. The number of vaccinations annually returned is sufficient, but the quality is unsatisfactory.

In Bibury district (population 1842, V.R. 28·6, I.V.R. 23·4, children examined 58, 10·3 per cent. unprotected) the contractor returns a large number of vaccinations in every parish, but in examining the schools, one in every ten children was found without scars, and of the remainder, there were 35 per cent. in whom the cicatrices are of such a character as to afford no ground for inferring that any protection has been communicated by the operation.—Axbridge Union comprises twelve contiguous parishes in which vaccination is performed from house to house, viz, Axbridge, Wedmore, Mark, Chapel Allerton, Berrow, Brean, Burnham, South Brent, Badgworth, Biddisham, East Brent, and Lympsham. In all of these, excepting the first, the functions of public vaccinator are discharged by several performers, the guardians having contracted with all the medical practitioners resident in the district. At Axbridge (population of the town 779) they contracted for the whole union in 1852, with a resident practitioner at a charge of 1*s.* 6*d.* per case, without reference to distance; this gentleman vaccinates entirely by his midwifery list, confining himself to the children of his own patients, and scrupulously avoiding solicitation of every kind. The consequence is, that in many of the surrounding parishes very little vaccination is performed. In the remaining parishes to which reference has been made, solicitation is employed with unexampled assiduity. In the parish of Wedmore (population 3,652) two resident practitioners have been appointed, one of whom (the medical officer of the district) vaccinates from house to house "in the intervals of other professional duties," the other by his midwifery list only. More than 30 vaccinations per mille of the population are annually returned, of which about 87 per cent. are performed by the medical officer. At Burnham (population 2,237) the guardians have in like manner appointed two resident vaccinators. In all about 34·8 per mille vaccinations are annually returned, of which 78 per cent. are performed by the medical officer. In South Brent (population 905) 39·6 in every thousand have been vaccinated; of these vaccinations about 22 per cent. have been returned by a practitioner residing in the village, between whom and the medical officer the most active rivalry exists. The next village, East Brent (population 797), is in another medical district; the vaccination rate is 40·1 per mille, one in four of the vaccinations being performed by the medical officer, who declines to engage in the discreditable competition which exists in the other districts. Similar statements might be made with reference to the other parishes mentioned above, showing that although the excessive sub-division of vaccination is even more prejudicial as regards

Bibury (Northleach).

Axbridge Union.

Axbridge.

Wedmore.

Burnham.

South Brent.

East Brent.

quality in the rural districts than it is in towns, it tends to increase the number of those vaccinated, for in all the parishes referred to, the vaccination rate far exceeds the birth rate.—Three districts, on the North Coast of Devon and Somerset, exemplify a similar combination of excessive vaccination rates with bad quality. In these instances, however, the excess is not stimulated by the rivalry of competing practitioners, but is rather attributable to the unnecessary performance of re-vaccination. All of these are remote districts, with scattered populations. In Porlock (population 1,170, V.R. 33·3, I.V.R. 26·5, children examined 54, 3·7 per cent. unprotected), 42 per cent. of the children seen in the school had scars which afforded no indication of successful vaccination. In Swymbridge (population 4,330, V.R. 21·0, I.V.R. 13·8, children examined 72, 15·3 per cent. unprotected), the corresponding per centage was 52; although in the parish of that name no less than 37 per mille of the population were returned as vaccinated. In like manner in Winkleigh school (population 1,425, V.R. 42·0, I.V.R. 18·9, children examined 60, 21·7 per cent. unprotected), the per-centage of bad protection was 36.

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

Porlock (Williton).

Swymbridge (Barnstaple).

Winkleigh (Torrington).

c. The number of cases annually returned is insufficient, while the quality of vaccination is good.

In Evercreech district (population 2,701, V.R. 18·5, I.V.R. 13·3, children examined, 134, 7·4 per cent., unprotected), the contractor complains of the increasing difficulty he experiences in persuading the people to have their children vaccinated. This unwillingness he attributes to their intellectual degradation. That his failure is due to other causes, is evident from the success with which vaccination is carried out in several of the adjoining districts. In Evercreech, where the contractor resides, most of the children are vaccinated, but in the other villages the rates vary from 2 to 16 per mille.—In the district of St. Decumans (population 5,670, V.R. 12·6, I.V.R. 6·4, children examined 136, 13·2 per cent. unprotected), vaccination appears to have been neglected for many years. In St. Decumans Parish, including the town and port of Watchet, the vaccination rate is 14·4; in another parish it is 7·4 per mille, while in two others, no vaccinations at all have been performed for several years. This state of things must be attributed to mere indifference on the part of all concerned,—an indifference which is the more remarkable, that a few years ago (1857) small-pox broke out with extraordinary severity at Watchet, about 100 persons being attacked, of whom seven or eight died.—In Northam District (population 3,612, children examined 70, 2·8 per cent. unprotected), in which no vaccinations were performed during the years to which the tables refer, the examination of the schools showed that most of the children are efficiently vaccinated. The explanation seems to be that though the contractor vaccinated most of the children, he did not think it worth while to charge for them.

Evercreech (Shepton Mallett).

St. Decumans (Williton).

Northam (Bideford).

d. Districts in which both quantity and quality are defective.

In the union of Tetbury, both contractors, who are partners, vaccinate indiscriminately at their surgeries and from house to house. One of them whose time is much occupied in private practice has for the most part neglected vaccination. He has now obtained the services of a qualified assistant, who in the course of 1863 vaccinated several hundred children by house to house visitation. In Didmarton district the vaccinator's register shows that the performance of vaccination has been regular in every parish.—The efforts of the vaccinator to persuade the uncouth inhabitants of the remote district of Combe Martin (population 2,408, V.R. 6·6, I.V.R. 1·2, children examined 84, 38·0 per cent. unprotected) to submit to vaccination have entirely failed. In the four villages comprised in the district the numbers annually vaccinated vary from 1·3 to 10·2 per mille. In 46·1 per cent. of the children

Tetbury Union, Tetbury and Didmarton Districts.

Combe Martin (Barnstaple).

apparently vaccinated had protection was indicated.—In the town of South Molton (population 3,830) vaccination is performed by four resident contractors, for the most part by house to house visitation; 53 per cent. of the vaccinations are performed by the contractor of the district. In the villages, vaccination is entirely domiciliary. There is great irregularity in the numbers returned, which are defective (nine per mille) in some parishes, excessive (37 per mille) in others.

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

South Molton. In certain Districts vaccination is performed by house to house visitations made at stated intervals of time.

In three districts, although vaccination is performed from house to house in the same manner as in those already referred to, the contractor's rounds are made at times fixed beforehand by him, or at regular intervals.—In Bisley district (population 4,692, V.R. 19·8, I.V.R. 16·6, children examined 100, 19 per cent. unprotected), the public vaccinator receives applicants at his surgery on the appointed day of attendance, after which he makes a round from house to house. —In Hartland district (population 2,950, V.R. 27·1, I.V.R. 23·7, children examined 7, 5·6 per cent. unprotected), and in the adjoining district of Bradworthy (population 2,177, V.R. 48·0, I.V.R. 39·4, children examined 50, four per cent. unprotected), in both of which the population is small and scattered, each of the contractors appoints a day of vaccination in each parish, on which he visits every house in which any child of fit age resides, guided by lists furnished by the registrar. The numbers of vaccinations annually returned in the 13 parishes contained in the two districts, vary from 31·8 to 50 per thousand of the population. In most instances, vaccination is performed from the arm. With this view, one or two healthy and popular children are vaccinated in each village a week before the appointed day, and are conveyed from house to house as vaccinifers. If this is not possible, recent lymph can always be obtained from adjoining parishes, for the whole district is visited at about the same time. This I believe to be the best way of working a district, having a very scattered population.

Bisley (Stroud).

Hartland and Bradworthy (Bideford).

II. Districts in which vaccination is performed at stations periodically.

In ten districts, vaccination is performed periodically at stations with strict regularity. As the difficulty of carrying out stational arrangements depends on the character of the district, it will be convenient to consider, first, those districts in which the population is extremely scattered, of which there are five, and secondly, those which are more populous.

Wick (Chipping Sodbury).

In the five districts of Wick, Dymock, Dulverton, East Pennard, and Pyworthy, the population is exclusively agricultural and extremely scattered. In the district of Wick (population 3,091, V.R. 34·5, I.V.R. 31·3, children examined 54, none unprotected), the attendance of the contractor at the stations is weekly, but inasmuch as it would be absurd to attempt to keep up constant attendance, he vaccinates for two or three weeks at the beginning of each quarter, employing an old woman in each village to announce his intended advent. The register shows that the attendances are perfectly regular, and the infantile rates indicate complete vaccination. During the three years to which the tables refer, 33 births per mille of the population were registered in the union, while in Wick district 31·3 per mille were vaccinated.—In Dymock district (population 3,098, V.R. 15·1, I.V.R. 8·0, children examined 151, 7·9 unprotected), vaccination is professedly conducted in the same way as in Wick. There is, however, only one station; the want of success indicated by the rates can scarcely be attributed to the distance of this station, for the defect is greater in Dymock itself than elsewhere. It appears to be rather due to irregularity and a variety of other circumstances, which have tended to

Dymock (Newent).

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

weaken the control exercised by the contractor over his people.—In the adjoining districts of Dulverton (population 3,091, V.R. 27·2, I.V.R. 23·9, children examined 181, 8·6 unprotected), and Brompton Regis (population 2,247, V.R. 28·2, I.V.R. 27·8); considering their extent and population, vaccination was carried out with remarkable success by the late contractor,* the monthly attendances stipulated in the schedule having been punctually maintained, even in the more remote parishes. The good attendance of the people must be attributed to the personal influence of the contractor, and to the systematic manner in which his duty is performed. In East Pennard (population 1,322, V.R. 34·0, I.V.R. 30·2, children examined 39, none unprotected), and in Pyworthy (population 1,841, V.R. 21·1, I.V.R. 20·1, children examined 33, none unprotected), almost all the children are vaccinated on the first day of attendance, the vaccinating days recurring monthly at East Pennard, quarterly at Pyworthy. It thus happens, that the majority of the vaccinations are performed with dry lymph, which has been preserved on points or glasses since the preceding vaccination. The defect which is observable in the last-named district arises from the absence of supervision; in Pennard this is exercised by the clergy.

Dulverton.

East Pennard (Shepton Mallet).

Pyworthy (Holsworthy).

Thornbury.

Intermediate in character between those districts and the following, is that of Thornbury (population 6,080, V.R. 23·6, I.V.R. 21·8, children examined 151, 4·6 unprotected). There are four stations, of which those on the north side of the district are visited every Monday, those on the south every Tuesday. The population is far too scanty to admit of this practice being followed with advantage, for even in Thornbury, where there are 1,545 people, I find that in 52 attendances during the year 1862, it only happened once that as many as five persons were vaccinated; twice there were four, six times there were three, thirteen times two, twelve times one, and on 34 occasions there was no attendance. The quality of the vaccination is bad, and the quantity deficient; the operation is usually performed with stored lymph.

Westbury-on-Trym (Clifton).

Westbury-on-Trym (population 5,340, V.R. 18·9, I.V.R. 16·4, children examined 147, 10·9 unprotected). In this district weekly attendance is kept up with great regularity at two stations, on the same day, in the parishes of Westbury (3,260) and Henbury (2,028), throughout the whole year, the smallest number vaccinated on one day being four. About four years ago, the contractor obtained a supply of lymph directly from the cow, which he has been enabled to maintain without having recourse to any extraneous sources. Vaccination is very rarely performed at the houses. The results of my examination of the school children show, that while the older children were all vaccinated, one in five of the infants were without scars.—In the populous and wealthy district of Midsomer (population 9,661, V.R. 24·2, I.V.R. 18·9, children examined 231, 8·2 unprotected), the majority of the inhabitants are occupied in coal mining, or in other industries dependent thereon. In consequence of this fact, wages are higher, education is more diffused, and the popular intelligence greater than in the agricultural districts. The three principal parishes have populations of 3,834, 1,958, and 2,226, and their vaccination rates are respectively 20·8, 21·4, and 36·8. The proportion of private vaccination is probably higher than in most rural districts, but it is also clear that there is some neglect. The higher rate in Radstock parish is attributable to an outbreak of small-pox about three years ago.—Bitton (population 2,909, V.R. 19·6, I.V.R. 19·2, children examined

Midsomer Norton (Clutton).

Bitton (Keynsham).

* This gentleman has been unfortunately displaced by the guardians.

37, 2·7 per cent. unprotected). The tabular numbers relating to this district are erroneous, the true rate being 25·6. As almost all the vaccinations are infantile, the protection of the population must be nearly complete. The register proves great regularity of attendance. The village being more than two miles from the residence of the contractor, the guardians, actuated by motives of economy, fixed the station at a distance from it; but this being found inconvenient, the meetings are now held at another station, in a more central position, but no fee greater than 1*s.* 6*d.* is paid to the contractor.

III. Districts in which vaccination is carried out by means of "cottage meetings."

Northern district of Cirencester Union.

In the Northern district of Cirencester Union (population 4,664, V.R. 27·1, I.V.R. 12·8, children examined 117, 5·1 unprotected), the contractor appoints cottage meetings in all his parishes at very irregular periods, sometimes neglecting vaccination for many months. It thus happens, that although all are eventually vaccinated, the operation is delayed in more than half of the cases beyond the first year of life. The register shows that vaccination is performed from arm to arm.—In Uley district (population 2,471, V.R. 6·9, I.V.R. 3·6, children examined 41, 39·0 unprotected), the defect exhibited in the rates is due to the incompetence and recklessness of the contractor's unqualified assistant, who often performs no vaccination at all for long periods. He, however, attributes his want of success to "the "prevalence of skin diseases, party spirit, and dissent."—In Newent district (population 5,850, V.R. 22·9, I.V.R. 15·7, children examined 208, 7·6 unprotected), the numerical defect depends on the want of supervision. The contractor appoints cottage meetings regularly in his parishes, selecting those periods of the year in which the people are least occupied in the operations of husbandry, but is unwilling to look up cases, and receives no help from the registrar. In 1859, one in ten of the population were vaccinated in consequence of the prevalence of small-pox. Of these 49 per cent. were between the ages of five and twelve, and 45 per cent. above the latter age.—Bourton (population 3,022, V.R. 19·8, I.V.R. 17·5, children examined 52, 17·5 unprotected). Here the vaccination rate leads to an erroneous inference; since the appointment of the present vaccinator the annual number of vaccinations per mille has been 31·8, thus indicating excess rather than defect. In the schools, the younger children were well protected, but the older were often unvaccinated, a fact attributable to the carelessness of a former contractor.—In Newnham district (population 8,601, V.R. 16·6, I.V.R. 10·9, children examined 114, 11·4 unprotected), cottage meetings are held very irregularly, and often discontinued for many months.—In Frampton district (population 3,241, V.R. 31·3, I.V.R. 30·3, children examined 106, 2·8 unprotected), cottage meetings are appointed in every village once or twice in each quarter, lists being furnished when required by the registrar. The numbers of vaccinations performed annually per thousand of the population vary from 22 to 33.—Chew Magna (population 4,422, V.R. 22·2, I.V.R. 20·2, children examined 83, 1·2 unprotected). The contractor, who is also registrar, holds cottage meetings twice or thrice a year in each parish. His register shows that these meetings take place at weekly intervals, so that an opportunity is afforded of vaccinating every child either from arm to arm, or with lymph collected on the same day as it is used. By means of lists prepared from the Register of Births, he is able to assure himself that every child is protected, and that the apparent defect shown in the returns is referable to private vaccination.—Keynsham (population 4,585, V.R. 12·6, I.V.R. 11·1, children examined 139, 8·6 unpro-

Uley (Dursley).

Newent.

Bourton (Stow).

Newnham (Westbury).

Frampton (Wheatenhurst).

Chew Magna (Clutton).

Keynsham and Corston.

APPENDIX.

Nos. 1–4. *Local Inquiries as to Vaccination.*

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

tected), Corston (population 2,030, V.R. 16·6, I.V.R. 11·7, children examined 54, 7·4 unprotected). In these two adjoining districts, the contractors are required to vaccinate only at their surgeries.* In order to afford facilities for the vaccination of children in the distant villages, they assemble them in cottages either at irregular periods (Keynsham), or professedly every quarter (Corston). So long as vaccination is going on, the meetings are held at weekly intervals, but it frequently happens that none are held for several quarters. This irregularity affords a sufficient explanation of the defect expressed by the returns, particularly in Keynsham, where the parochial vaccination rates vary from 5 to 15 per mille.—In Broadhempston district (population 1,035, V.R. 18·9, I.V.R. 5·9, children examined 40, 2·5 unprotected), the tabular rates are erroneous, the number per mille annually vaccinated in the three years terminating Michaelmas 1862, being 25. Cottage meetings are held during the summer months only; hence vaccination is often unduly postponed, less than a third of the cases being infantile.—Plymstock (population 3,548, V.R. 41·5, I.V.R. 32·1, children examined 73, 4·2 unprotected), Egg Buckland (population 5,552, V.R. 28·7, I.V.R. 22·8, children examined 51, 4·0 unprotected). In both these adjoining districts, the contractors look up vaccination with great care, guided by registrars' lists. The meetings are held every quarter, but at irregular times. In all the parishes excepting one, the numbers annually vaccinated are sufficient for the complete protection of the population, and in some the rates are excessive, *e.g.* from 40 to 60 per mille. This excess is partly due to arrear vaccination, (both contractors having been recently appointed), but mainly to the circumstance that the works now in progress for the fortification of Plymouth have given rise to the immigration of labourers and their families into many of the adjoining parishes. The registers show that 95 per cent. of the children vaccinated were of ages less than twelve months, so that it is evident that the latter cause must have been much more operative than the former.

Broadhempston (Newton).

Plymstock (Plympton).

V. Districts in which vaccination is performed at times appointed on each occasion by the contractor, but at fixed places of meeting.

In 33 districts the children are assembled in school-rooms, pay-rooms, or other fixed places of meeting at times determined by the contractor, and arranged on each occasion. Wherever this plan is systematically carried out, it is found to be efficient, but in very many of the districts in which the contractors profess to adopt it, the meetings are held so irregularly that the arrangement must be regarded as merely nominal. Thus, in the three districts of Marshfield, Churchill, and Dunster (in which the vaccination rates are severally 11·8, 13·6, and 13·8, the infantile vaccination rates 5·9, 7·7, and 9·6, and the percentages of unvaccinated children in the schools 26·5, 15·0, and 21·4,) the failure of the contractors' efforts was clearly due to such irregularity, for the registers show that in the three years ending Michaelmas 1862, there were two attendances in each village in Marshfield district, two in each parish in Dunster district, which took place at an interval of more than two years, and one attendance in the parish of Churchill.

Marshfield (Chipping Sodbury); Churchill (Axbridge). Dunster (Williton). Hutton (Axbridge).

Three districts may be referred to as instances of the successful working of this system. In the district of Hutton (population, 3,370, V.R., 24·5, I.V.R., 17·2, children examined 44, 2·2 per cent. unprotected), the contractor states that he vaccinates exclusively at the stations, one of which is appointed in each of his seven parishes. His register shows that he commences his weekly attendances each spring, in March or April, in one of the most populous villages, appointing similar meetings in other villages successively until he has completed

* At my suggestion, the guardians have since remodelled their arrangements.

the district.—In Butleigh (population 5,402, V.R. 35·9, I.V.R. 26·7, children examined 108, 2·8 per cent. unprotected), meetings are held at very irregular intervals; they are announced on each occasion by the bellman. After two meetings have been held, notices are served, by direction of the contractor, on all parents who have neglected to bring their children. This has been accomplished by the officers of the county police, who have placed a constable at the disposal of the contractor for the purpose when necessary. Lists have also been furnished for his guidance by the registrar. It is worthy of note that in both of these districts, although the numerical success of the system has been complete, vaccination is performed almost exclusively with dry lymph, and very great difficulty is experienced in inspection. In one district the contractor inspects by domiciliary visitation, in the other he admits that he has often to content himself with hearsay evidence of the success of his operations.—Lynton district (acreage 28,385, population 2,413, V.R. 38·2, I.V.R. 24·9,) is worthy of notice as affording evidence that vaccination may be successfully carried out by stational meetings, even in the most scattered districts, if they are not fixed too frequently. It comprises six villages, many of which are in the most remote situations among the hills of Exmoor. The contractor assembles the parents yearly in each village, attending weekly so long as there are children to vaccinate. He states that almost all are vaccinated directly. The first meeting is announced by the overseers.

Butleigh (Wells).

Lynton (Barnstaple).

It is to be observed that one of the most important conditions of success consists in the employment of an efficient mode of announcement. It is seldom that a contractor is able to obtain the aid of the bellman, or of the local authorities as at Lynton; usually he must content himself with such opportunities of announcing his arrangements as his ordinary rounds may afford him, or he must look up the parents from house to house.

When school-rooms are the places of meeting, it often happens that the masters have it in their power to give the most efficient aid in the assembling of the children. They are not, however, always willing to do so, but there can be no doubt that if any plan could be devised by which it could be made their interest to exercise this kind of supervision, the success of the vaccination meetings would be much promoted.

Importance of the agency of schoolmasters;

In several districts I met with particular parishes in which the supervision was undertaken with complete success by the clergy. Thus, in two of the districts in the neighbourhood of Wells, I am informed that in almost every parish the clergyman takes the trouble of arranging and announcing the meetings appointed by the contractor. In many of these parishes the registers show that vaccination is complete. It is to be regretted that this example is not more generally followed.

and of the clergy.

URBAN DISTRICTS.

Bristol and Clifton.

Bristol.

The Bristol Incorporation District comprises the oldest and most central part of the town, almost all of which would be included within a circle of a mile in diameter, having its centre in the High Street. Its area is only 1,840 acres; which space is occupied by a population of 66,027. It is divided for the purpose of vaccination into five districts, which are identical with the sub-districts for registration. These districts were formed in the year 1869, before which time the Incorporation also comprised six districts, the limits of which were

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different. At the same time that this change was made, the guardians contracted with two of their medical officers who had not previously been public vaccinators, so that the number of vaccinators was increased from six to eight.

During the two years preceding these alterations, the numbers vaccinated in each year were severally 1,231 and 1,941; since 1859 they have been 1,378, 1,510, 1,266, and 1,364 in successive years; so that the mean of the four years succeeding 1859 (1,379½) was considerably less than the mean of the years 1858 and 1859. It thus appears that, even as regards quantity, the increase in the number of performers has rather been prejudicial than otherwise. If it had not been for the slight increase of vaccination produced by the presence of small-pox in 1860, the diminution would have been more marked.

Appointment of additional vaccinators.

Consequent diminution of the numbers annually vaccinated; and of attendance at his stations.

The following table, showing the number of persons attending at three of the principal stations in Bristol during the years 1858–1862 exhibits a considerable falling off in the applications at these stations:

Annual Number of Persons vaccinated at the following Stations in five years.

Stations.	1858.	1859.	1860.	1861.	1862.
66, Thomas Street -	181	288	150	133	113
27, Milk Street - -	272	405	258	230	220
7, St. Augustine's Place - -	328	530	253	274	310

Arrangements now in operation.

The arrangements at present in operation in Bristol are as follows: In the district of St. Mary Redcliffe (population 14,335) there are now three stations where there was formerly only one. The original contractor vaccinates applicants exclusively, but the newly-appointed vaccinator also performs vaccination on his rounds as medical officer. In the Castle Precincts district and in that of St. Paul there are still single stations, at which weekly attendance is regularly given. In the district of St. James the contractor, who is also a medical officer, in addition to his attendance at the station, has visited from house to house during the recent prevalence of small-pox, particularly in the quarter inhabited by the Irish. In St. Augustine's district there are three stations, two of which are worked by the medical officer, who, as above stated, also vaccinates at the houses. In addition to this, one of the other contractors, who happens to reside in the district, vaccinates largely at his surgery.

From the preceding facts it is evident that, in adding their medical officers to the existing staff of vaccinators, and in increasing the number of stations from five to nine, the guardians have seriously injured the public vaccination of Bristol. Owing to the diminished number of applicants at each station, the selection of vaccinifers has been injuriously restricted, and the supply of lymph occasionally interrupted. In addition to these evils, domiciliary vaccination has been introduced,—

Domiciliary vaccination.

a practice which is altogether indefensible in a town like Bristol, where experience shows that it always leads to the improper use of dry lymph and the irregular discharge of the contractor's duties, particularly of inspection.

Clifton.

Clifton Union comprises three districts, which are principally or entirely urban, viz., Clifton (population 21,375, V.R. 7·7, I.V.R. 6·6, children examined 346, 5·5 unprotected), St. Philip and St. Jacob (population 31,753, V.R. 19·4, I.V.R. 18·0, children examined 200, 11·5 unprotected), and St. James and St. Paul (population 16,759, V.R. 42·8., I.V.R. 15·7, children examined 167, 19·8 unprotected). In Clifton district, which includes, in addition to Clifton proper, that

part of the town which skirts the river Avon, and is inhabited principally by the poor, as well as in that of St. Philip and St. Jacob, vaccination is performed exclusively at the station, all the times of attendance being weekly. In the other districts, in addition to their stational attendances, the contractors receive applicants at their surgeries. The rates afford no reliable indication of the quantity of vaccination; for in all of the districts the population is largely made up of persons belonging to the wealthier classes. Moreover, the applicants at the several stations are not necessarily inhabitants of the district to which the station belongs.

In Cirencester, a town of 6,336 inhabitants, no arrangements for the performance of vaccination at a fixed station are in operation. Among the children of the poor, however, unless they happen to be dissenters, vaccination is universal, for the rule that no unvaccinated child shall be admitted to the National School is strictly enforced. Cirencester.

In Stroud (population of the town 9,090, V.R. 24·2, I.V.R. 21·9, children examined 323, 8·1 per cent. unprotected), 220 vaccinations are annually returned by the contractor. The numerical success which is indicated by the vaccination rate, must be attributed to the systematic supervision which is exercised by the contractor and registrar, the latter of whom furnishes a list of unvaccinated children of fit age regularly every month. By means of these lists, the contractor personally enquires into every case of neglect. Vaccination is not performed periodically, or at fixed stations, but by cottage-meetings arranged by the contractor, according to circumstances in localities, where there happen to be children to vaccinate. On inquiring into the cases of apparent neglect met with in the school, I found that most of the unscarred children had been ostensibly vaccinated by private practitioners. Stroud.

In the town of Weston-super-mare (population 8,031, V.R. 19·6, $\frac{V}{B}$ = 0·66, children examined 426, 8·4 unprotected), public vaccination is divided among no less than four practitioners. Formerly there was but one vaccinator for the whole town, who was also the medical officer of the district; but in 1858, the guardians contracted with two other practitioners, and in 1862 added two more to their staff. As regards quantity, it does not appear that there has been any diminution of the numbers vaccinated, but rather the contrary, nor is there any such numerical deficiency as to justify the inference that if all ostensible vaccinations were real, the population would be unprotected, for during the three years preceding my visit, the number vaccinated constituted exactly two-thirds of that of the births, a proportion which scarcely falls short of that which is met with in town populations known to be completely vaccinated, and is as high as could be looked for in a town like Weston, where the wealthy and their dependents form so large a proportion of the population. But as regards quality, there can be no doubt that the existing state of things is unsatisfactory. All of the contractors vaccinate in an irregular manner from house to house. In visiting the schools, I found that although children vaccinated by the medical officer of the district exhibited characteristic cicatrices, there were 8·0 per cent. of the children without scars, and of the remainder, 21·7 per cent. exhibited marks of an anomalous appearance. Weston-super-Mare (Axbridge).

IV.—Quality of Vaccination.

Table III.—Showing the Number of Children examined in each of 32 Unions, and the Number and Quality of the Cicatrices of Vaccination.

Name of Union.	Total.	None.	Doubtful.	Typical.				Passable.				Bad.				With Marks of Small-pox, and having Vaccination Marks as under:—					
				4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	None.	Doubtful.
Bristol	609	59	—	2	122	210	78	6	23	61	37	—	—	—	11	—	—	—	2	9	—
Chipping Sodbury	488	58	4	1	52	78	70	1	55	77	58	—	6	11	17	—	—	—	—	—	—
Cirencester	700	61	1	20	22	215	66	8	20	174	73	—	3	19	18	—	—	—	—	1	—
Clifton	1,223	136	4	5	82	438	170	7	53	187	99	1	3	13	25	—	—	1	—	1½	—
Dursley	453	82	4	29	23	68	55	19	27	73	47	3	3	9	11	—	—	—	—	1	—
Newent	439	36	2	3	31	75	57	29	52	86	50	0	5	5	7	—	—	—	—	1	—
Northleach	307	27	7	2	2	47	81	1	14	47	51	—	2	6	20	—	—	—	—	—	—
Stow-on-the-Wold	362	63	5	8	47	69	32	5	28	54	30	—	4	7	10	—	—	—	—	—	—
Stroud	1,060	77	8	43	66	269	109	30	62	229	110	2	13	15	27	—	—	—	—	2	—
Tetbury	430	78	3	2	20	40	42	5	29	116	72	—	3	3	17	—	—	—	—	—	—
Thornbury	580	40	1	21	79	67	39	46	75	122	68	1	4	8	9	—	—	—	—	—	—
Westbury-on-Severn	513	78	3	9	59	132	56	8	43	71	39	—	1	6	8	—	—	—	—	1	—
Wheatenhurst	298	13	2	2	22	119	29	1	25	45	29	—	—	—	11	—	—	—	1	—	—
Axbridge	1,207	101	4	6	50	206	172	4	57	294	231	1	13	19	49	—	—	—	—	2	—
Clutton	596	36	4	3	80	134	74	3	67	105	61	—	4	6	19	—	—	1	—	—	—
Dulverton	199	13	4	—	12	89	22	—	—	40	18	—	—	2	2	—	—	—	—	—	—
Frome	727	54	3	2	14	192	146	5	20	174	98	—	2	7	10	—	—	1	—	4	—
Keynsham	409	36	0	3	18	140	80	1	28	52	41	—	1	1	8	—	—	—	—	4	—
Shepton Mallet	621	56	1	2	6	128	173	1	8	108	88	1	5	15	29	—	—	—	—	—	—
Wells	666	84	6	4	14	68	84	7	45	141	158	—	6	25	24	—	—	—	—	4	—
Williton	574	59	4	1	23	107	98	2	14	128	98	1	1	6	30	—	—	1	—	1	—
Wincanton	521	40	4	6	42	102	85	1	39	74	95	—	4	12	17	—	—	—	2	5	—
Barnstaple	776	117	8	51	41	79	68	52	37	165	100	—	9	20	29	—	—	—	—	1	—
Bideford	523	50	3	14	43	110	67	8	39	110	48	1	3	9	18	—	—	1	—	11	1
Crediton	498	42	4	11	55	102	65	7	17	106	50	4	2	14	19	—	—	—	—	—	—
Holsworthy	189	9	—	5	6	47	22	8	19	42	23	1	—	5	2	—	—	—	—	—	—
Newton Abbot	1,114	180	3	56	65	213	120	47	71	188	111	3	2	21	34	—	—	1	—	16	—
Plympton	473	22	3	14	69	129	97	10	15	62	30	—	1	3	17	—	—	—	—	2	—
South Molton	529	37	5	19	28	90	120	17	37	90	54	—	6	11	15	—	—	—	—	—	—
St. Thomas	755	82	6	16	71	186	113	8	42	113	70	—	3	18	27	—	—	—	—	15	—
Tiverton	645	129	6	3	43	139	88	1	37	140	39	—	2	11	9	—	—	—	—	8	—
Torrington	379	63	1	8	18	104	47	5	16	59	43	—	—	4	11	—	—	—	—	22	—
Totals	18,863	2,019	113	371	1,327	4,190	2,625	353	1,114	3,533	2,219	19	111	312	560	—	—	6	5	121	1

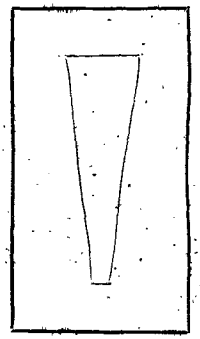
In the inspections of 1863, the quality of vaccination was investigated on the same plan as in those of the previous year. The utmost possible attention was devoted to the examination of schools, particularly in the rural districts. I endeavoured, when practicable, to have the assistance of the public vaccinators in my inspections, and to bear in mind, in recording the characters of the scars, the mode of operating which had been employed. These examinations have confirmed me in the belief that "to the practised eye, the vaccination scar reveals the "origin and nature of the process by which it has been produced," and that scars produced by any given method of operating exhibit appearances which are so distinctive, that they can in almost every instance be recognised.

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

Quality of vaccination.

In the tabulation of the results of school inspections, I have employed the terms, "typical," "passable," and "bad" in the same senses as in the Report of 1862, *i.e.*, I have depended on *area* as the ground of distinction between typical and passable cicatrices. All scars possessing characteristic foveæ have been registered in the first two columns, but those, of which the area was less than that of the normal vaccine vesicle, I have regarded as defective and registered under the heading "passable."

Mode of tabulating quality of cicatrices.



In order to determine the normal area of the vaccine vesicle in the first instance, and subsequently for the purpose of keeping the rough estimate of size, which can be made on examining school children, constantly under the control of measurements, I have employed a gauge, of which a diagram is annexed. It consists of a plate having a central V shaped opening. Each lateral margin of the aperture is divided. On the left side, the number opposite each division indicates, in terms of one inch, the length of a line drawn therefrom to the opposite side, parallel to the base. On the right, the numbers express in terms of a square inch, the areas of the corresponding circles, so that by placing the plate on any circular space in such a manner, that its circumference is cut at opposite points by the margin of the aperture, its area may be correctly determined.

Estimation of area.

In the estimation of the protective value of cicatrices, it appears preferable to take into account the aggregate area of surface foveated in a characteristic manner, rather than to depend entirely and absolutely on the number of good scars observed. To this opinion I am led by the following considerations:—If lymph is introduced by any method of single insertion, *i.e.* by any method of operating in which it is brought into contact with the living absorbent surface at one point only, a vesicle is formed which rarely if ever exceeds 0·12 square inch. This being admitted, those vesicles only of which the area does not exceed a tenth of a square inch, can be regarded as single. Any greater size would imply that the vesicle is of complex or multiple origin, produced by the blending together of the results of an indefinite number of insertions, uniformly distributed over a limited space. It is found that scars of multiple origin usually exhibit some irregularity of contour, especially when they are of very large size. But this irregularity is by no means constant, for if lymph is inserted by a number of minute punctures or scratches, pretty evenly distributed

The aggregate area of foveated surface ought to be taken into account.

Distinction between single and multiple vesicles and cicatrices as regards area; as regards contour.

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over a carefully limited circular space, a circular scar will be produced, which will have a regular circular or elliptical outline, or be very slightly scolloped. In this case, the mere contour affords no indication of its multiple origin. Again, it is to be observed, that just as the multiple vesicle differs from the normal or single one in the absence of the central depression, so the corresponding scar does not possess the central smooth elevation, which in the normal scar affords evidence of the origin of the vesicle from a single point of inoculation, and of its centrifugal development.

In investigating the state of protection of large numbers of children from the tabulated results of inspection, two methods may be employed. On the one hand, we may adopt, as a criterion, the product of multiplying the whole number of scars tabulated by the mean area,—a very excellent criterion if the mean area could be determined with any degree of accuracy; on the other hand, the area observed in selected typical scars may be multiplied by the prevalent, or most frequently recurring, number. The latter is the method which appears to be at once the most practicable and most reliable. For it is of greater importance to know the prevalent character of the vaccination of a district, than to determine the whole quantity of protective scars possessed by every hundred of the children.

In the following statement, those districts only are referred to which are remarkable either for the good or bad quality of their vaccination, as indicated by the results of my examinations of children in schools. The classification adopted is founded in the first place on the prevalent number of vaccination marks, and secondly, on the area of foveated surface exhibited by each cicatrix.

I. Districts in which the prevalent number of scars is *four*.

a. the prevalent area of each scar exceeds 0·12 sq. inch.

Stonehouse (Stroud).

In the populous district of Stonehouse (population 5,516, acreage 4,004,) all the vaccination is performed at the surgery. The contractor, "although pressed by the guardians on the subject, declines "altogether to look up his cases." He used formerly to vaccinate by puncture, but has abandoned this method, and now inserts by numerous scratches crossed over a surface of about 0·5 square inch, thus producing a large compound vesicle. Each typical scar has an area of 0·2—0·25 square inch; its contour is slightly oval, but very regular, and exhibits characteristic foveæ, which are most numerous around its margin. At Bovey Tracey, the vaccination is also entirely stational. The contractor has paid much attention to vaccination, and has kept notes of his results for many years. Having tried almost all the usual methods of insertion, he finally adopted that employed by Jenner, as the best. The scars observed in children so vaccinated, have an area of 0·2—0·25 square inch. They are regular and well foveated, but exhibit no central elevation. This instance shows that in the hands of a painstaking and skilful operator, who makes a hobby of vaccination, the old method may produce excellent results.—At Berkeley the birth-place of Jenner, and the principal scene of his labours, vaccination is performed in a very irregular manner at the surgery of the contractor, and at a station in another village. The scars are usually very small indeed, so that, notwithstanding the high number, their aggregate area amounts to no more than 0·36 square inch. The contractor derives his supply mainly from his own district, almost always using dried lymph stored between glasses.—Barnstaple. In this town the scars observed in children vaccinated by the contractor are remarkably characteristic. Their area never exceeds 0·12 square inch, but their form is regular; they are produced

b. the prevalent area is less than 0·12 sq. inch.

Berkeley (Thornbury).

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

Bradworthy (Holsworthy). Chulmleigh (South Molton). Chittlehampton (South Molton).

by superficial puncture with dry lymph, of which the contractor maintains his own supply, but never stores it longer than seven days.—In the extensive but very thinly-populated district of Bradworthy (population 2,177, acreage 19,277,) the contractor holds vaccinations periodically in the villages. He inserts by puncture, either vaccinating from arm to arm or using recently collected dry lymph. His scars are remarkably regular and satisfactory.—At Chulmleigh the contractor formerly made a smaller number of insertions, and has adopted his present method in compliance with the instructions of the privy council. He inserts by a single scratch in the direction of the arm. Each scar has an area of 0·10 square inches; its contour is very elliptical, and its surface is beset with shallow but distinct foveæ.—In children vaccinated by the contractor at Chittlehampton, the scars are uniformly small (area 0·06 — 0·08 square inch) but exhibit very characteristic appearances. Their contours are circular, their centres elevated and smooth, and their margins indented and beset with pits. Vaccination is performed by puncture, usually with dry lymph.

II. Districts in which the prevalent number of scars is *three*.

a. The prevalent area is greater than 0·12 sq. inch.

Westbury-on-Severn. Newnham (Westbury-on-Severn). Midsomer (Clutton).

In the five districts of Westbury-on-Severn, Newnham, Midsomer, Instow, and Plymstock, vaccination is performed in the same manner, viz., by crossed scratches. The variations in the area and other characters of the scars depend on the form given to the surface over which the abrasion extends. The best results were observed at Westbury, Newnham, and Midsomer. At the first, where I saw several vaccinations performed, the area of abrasion is about 0·2. This produces an oval scar having an area of 0·15 — 0·20 square inch, the whole surface of which is foveated. In comparing this result with that observed in Stonehouse, it is seen that the area of the scars in the two districts is in direct relation with that of the abrasion by which they are produced. In this district, as well as in those of Newnham and Midsomer, large numbers of children were examined, so that the results could be judged of very satisfactorily. In all three districts vaccination is for the most part performed from arm to arm. Lymph is stored on points which are carefully kept in corked or stoppered bottles. In Midsomer district vaccination is performed entirely at the stations, in Westbury partly so, and in Newnham entirely at the houses of the parents. In the district of Plymstock, where the area of the scars is somewhat smaller (0·12 — 0·15 square inch), they present in other respects precisely the same characters. Vaccination is performed at the cottages, in which the children are assembled from time to time, at the convenience of the contractor.

b. The prevalent area is less than 0·12 sq. inch.

St. James (Bristol).

In the densely populated district of St. James, Bristol, in which most of the public vaccination is performed from arm to arm at the station, the same method of insertion is employed as at Westbury; but in consequence of want of care in limiting the abrasion to a definite area, the resulting vesicles (as seen at the eighth day in children brought for inspection to the station) and scars (as seen in the schools) do not exhibit that regularity of outline which I have noticed elsewhere. This defect, however offensive it may be to the eye of the fastidious vaccinator, can hardly be supposed to be of any importance whatever in relation to the protective value of the operation. In all the remaining districts in which three is the predominant number of scars, lymph is inserted by superficial puncture. In four of them, typical scars were so generally met with as to imply a careful performance of vaccination, viz., in Chipping Sodbury, Didmarton, Northam, and Yealmpton; in the rest the results were inferior.

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

III. Districts in which the prevalent number of scars is *two*. *a*. The prevalent area is above 0·12.

Pyworthy (Holsworthy).

St. James and St. Paul (Clifton).

Whitminster (Wheatenhurst).

At Pyworthy, a very remote and thinly-populated district near Holsworthy, on the borders of Devon and Cornwall, a day is appointed by the guardians, and announced by the registrar, on which the contractor goes round his district from village to village, provided with lymph which has been preserved between glasses since the previous vaccination. He keeps his time punctually at each station, and states that he finds the greater number of the children who are of proper age for vaccination assembled. A second attendance is given on the day of inspection, when a few more children are vaccinated; no more vaccination is performed until next quarter. Thus it happens that the majority of the children are vaccinated with old and dry lymph, those only whose parents neglect to bring them on the appointed day having the benefit of arm to arm vaccination. Notwithstanding this, the results observed in the school are excellent. The contractor inserts by crossed scratches, and is not over careful in limiting his area of abrasion. Some scars are met with which are not only irregular in form but afford evidence of excessive action or of ulceration, which may probably be attributed to want of due care in this respect.—St. James and St. Paul.—The contractor makes a group of insertions by fine crossed scratches so near to each other that the resulting vesicles coalesce. The general characters of the scars are satisfactory, but their contours are peculiar and distinctive of the method of insertion. They may be regarded as equivalent in protective efficacy to four at least of ordinary size.—In Whitminster district, where the size of the scars is no less remarkable than in the preceding, the lymph is inserted not by abrasion, but by several parallel scarifications, which cover an area of about 0·2 square inch, or even larger, when the child is intended to be a vaccinifer. A very large but regular vesicle is produced, which never ulcerates nor exhibits any sign of abnormal action.

Clifton.

Bristol.

As regards quality of vaccination, Clifton district of Clifton Union may be advantageously considered along with that of Bristol, for although not under the control of the guardians of Bristol Incorporation, it may be regarded as practically forming part of the town. Moreover, the arrangements for vaccination are identical, and the prevalent methods similar. It may be stated generally that vaccination is better performed in Bristol than in any large town that I have had occasion to visit. This may no doubt be attributed to the circumstance that for many years public vaccination has been performed by practitioners who have devoted special attention to the subject, and who have not only practised the best and most efficient methods themselves, but recommended them to the profession generally. The permanence of this favourable effect is no doubt owing to the appointment of a qualified teacher of vaccination, by whose personal instructions many of the younger surgeons in Bristol have profited. Mr. Sheppard vaccinates by three insertions on one arm, each of which is made by parallel scratches with a blunt lancet. All of his pupils have adopted the same plan. In Clifton, vaccination is performed exclusively at the station, where attendance is given weekly during the whole year. Most of the scars seen in the infant schools are regular, and their surface beset with pits. In the infant schools of Bristol, in which it was in general not possible to distinguish between the work of different vaccinators, most of the scars are large, of regular circular contour (area 0·16 — 0·20 square inch) and well pitted. The method I have referred to is adopted by all of the gentlemen engaged in public vaccination in Bristol, excepting one, viz., the medical officer of the Castle Precincts District, who has abandoned it on the ground that the vesicles pro-

duced are apt to be accelerated in their progress, and occasionally end in ulceration. In direct vaccination he inserts by superficial puncture, and in employing dry lymph-confines his area of abrasion within the narrowest limits. Consequently, on the adoption of these methods, this gentleman obtains much smaller vesicles than those usually met with. Those seen by me at his station had circular contours, well-marked central depressions, and tumid margins. I had no opportunity of distinguishing the scars resulting from these vesicles in the schools.

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Among the districts in which the area of the vaccination scar is small, it will probably be sufficient to refer particularly to those only in which other defects were noted.

5. The prevalent area is less than 0·12 sq. in. Uley (Dursley).

In a village in Gloucestershire, where vaccination has long been performed by an unqualified assistant, almost all the children in the school exhibit unsightly oblong scars, such as might have been produced by an instrument having a blunt and jagged edge. In a neighbouring town I found, on visiting the schools with the contractor's qualified assistant, who performs the vaccination, that the scars were in general not only very small, but so far from typical, that they could scarcely be recognized as vaccination scars at all. Many of the children had been recently vaccinated; among these it often happened that insertion marks several days old could be observed, which had produced no result. It appears that the vaccinator had been vaccinating very actively by way of preparation for my visit, having operated on a hundred children during the previous fortnight. This had been done by house to house visitation, with lymph preserved in capillary tubes. The want of success is no doubt due to the mode of insertion employed (puncture with Spratly's vaccinator), and to the careless rapidity with which the operation had been performed. Of 279 children, whom we examined in the school, 21·3 per cent. were without scars; in 31 per cent. of the scarred children the marks were of such a character as to afford no indication of protective vaccination.—In two villages in Somersetshire, which were noted as specially ill-vaccinated, the scars being small and of imperfect character, the contractor holds meetings for vaccination every quarter at the appointed stations, so that most of the children are vaccinated from arm to arm. Notwithstanding this, the employment of a bad method of puncture leads to the unsatisfactory results I have referred to. The same observation applies to another district in this county. Here the contractor's register shows that weekly attendance is given in the village during the summer months. From the regularity with which these attendances are maintained, as well as from the entries made by the contractor, in conformity with their lordships' regulations with respect to the source of lymph employed in each vaccination, it may be inferred that lymph is almost always taken directly from the arm, yet scarcely any of the scars exhibited typical characters. In a large town of North Devon (population 5,742) all the vaccination is performed at the surgery with dry lymph, without any regularity as to the times of attendance. The contractor stores lymph on points, charging a great number from one vesicle, and inserts by puncture. The results are of the worst description. In a rural village in the same district, even the best cicatrices are small, while the majority are also irregular in form and character. Here the contractor inserts by three punctures; he vaccinates at long and variable intervals. In commencing each series of vaccinations, he selects a healthy child as a vaccinifer, from whose arm all the others are vaccinated, either directly or by conveyance on points, so that, with the exception of the first, all receive fresh lymph. In an adjoining district in the same part of Devonshire, although the number of vaccinations exceeded the births by nearly 60 per cent.,

22 per cent. of the children examined in the school were found to be without vaccination scars. It is probable that all the children had been nominally vaccinated; in a considerable proportion the operation had failed entirely; in a larger number it had produced imperfect results, leaving a remainder of 30 per cent., who appeared to have been efficiently vaccinated.

It may be readily understood, that so great a defect in the number of insertions as is implied by finding most of the children in a school with only one scar, affords good ground for presuming that vaccination is badly done in other respects, for it seldom happens that vaccinators intentionally confine themselves to one insertion. More frequently singleness of scar is dependent on failure of one or more insertions; and when this is the case, it may be inferred that the method of vaccination employed is uncertain or unworthy of dependence; for a vaccinator who habitually fails in two out of three insertions, will probably fail in a corresponding proportion of children.

Swymbridge (Barnstaple).

The worst performance of vaccination that I have yet met with occurred in a remote rural district in North Devon,—Swymbridge. The contractor inserts by puncture; he vaccinates entirely with dry lymph, using the points supplied to him by the National Vaccine Establishment. In order to make these points go as far as possible, he limits the number of insertions, and makes his punctures in such a manner (to judge by the scars) as scarcely ever to produce a good vesicle. His excuse is that the people will not allow him to take lymph from their children. In one of the districts of Axbridge Union, the quality of vaccination is nearly as bad, but may be referred to somewhat different causes. In this district the guardians (see p.) have in several instances appointed more than one contractor to act in the same village, without making any proper arrangements for the limitation of their functions. Hence it arises that as soon as a child is born, A. "looks-up" the parents and solicits for the vaccination, B. "follows up" A. on the ground that the parents were originally his patients. The result is that, although many more vaccinations are performed than children born, scarcely half of the children are efficiently vaccinated. The vaccination rates in the principal villages for the three years ending Michaelmas 1862, were as follows: Burnham 34·8, South Brent 39·6, East Brent 40·1. During the same period, the birth-rate of the Union was 30·3. Such a state of things is entirely inconsistent with good vaccination, even if it be not destructive of it, for it is little to be expected that a contractor who can bring himself to engage in so discreditable a competition should be over scrupulous either as to the performance of the operation or the inspection of its results. He must surrender himself to the whims of the ignorant peasants with whom he has to do, who yield to vaccination only under the imaginary compulsion of the law, and are well-pleased to have their children vaccinated in the least effectual manner possible.

Axbridge Union.

After these districts, might be mentioned several others in which, although the unsatisfactory character of the scars cannot be referred to any special cause injuriously affecting vaccination, it is sufficiently accounted for by general carelessness and complete absence of method. In answer to the inspector's enquiries, as regards the arrangements by which vaccination is carried out in his district, the contractor will make some such statement as, "I catch them as I can," or "when I see "an unvaccinated child I do it," and as regards inspection, "I look in "the next time I pass that way," or "if the vaccination doesn't take "I hear about it." These and similar phrases express a state of things that I have repeatedly met with in all the counties I have visited.

Watchet.

In the town of Watchet small-pox prevailed during the latter half of 1857 and 1858 in a very unusual manner. Watchet is a rapidly increasing seaport town of about 2,000 inhabitants. It appears that in the spring of 1857, when the first case occurred in the person of a sailor from the town of Cardiff, on the opposite side of the channel, the town was overcrowded by labourers employed in the construction of the new harbour. A hundred cases are stated by the medical officer of the district to have come under his observation, of which seven or eight were fatal. I have already adverted (p.) to the extraordinary neglect of vaccination in the district in which Watchet is included, to the large proportion of unvaccinated children seen in the school, and to the discontinuance by the registrar of all his duties relating to vaccination. I may add that vaccination is well performed, and that all the fatal cases occurred among the unprotected.

Bideford.

In the town of Bideford, where the results of local inquiry have been most unfavourable both as regards quantity and quality, and in which the contractor has departed as far as possible in his practice and arrangements from their Lordships' instructions, I found that small-pox had prevailed in the town in 1859, and had proved fatal to eleven persons, two of whom were adults. Among 180 children examined in the school, seven were marked by the disease, none of whom had been vaccinated. From Bideford the disease was conveyed to the town of Torrington, where it prevailed throughout 1860, the outbreak attaining its acme in May. Thirteen persons died, of whom seven were under five years of age, four between five and twelve, and two above the latter age; 21 disfigured children were seen among 142, none of whom had been vaccinated. The performance of vaccination had been most irregular.

In Newton Abbot small-pox broke out in the spring of 1859, and remained in the town until the autumn of the following year; its greatest prevalence was in November and December. 22 deaths were registered, of which 16 were among children under five. During the same period small-pox was prevalent in several of the neighbouring villages, particularly in Teignton, Abbotts Kerswell, and Ipplepen; in these places 10 deaths were registered during 1859 and 1860.

In all of the towns in which small-pox prevailed, vaccination had been signally neglected.

All of the towns above mentioned might have been selected as places in which invasions of small-pox were probable. All are signal instances of failure both as regards quantity and quality,—absence both of system and supervision. In each instance vaccination is performed at any time or place according to the convenience of the contractor or his patients, and in most cases the worst methods of operating are employed.

In Stroud the spread of small-pox was prevented by vaccination.

I met with several instances in which small-pox was introduced into a district, but was prevented from spreading by effectual vaccination. Thus, in Stroud, a town of 9,000 inhabitants, isolated cases of small-pox have presented themselves four times during the last five years among the rag sorters employed in the paper mills, but the disease has never become prevalent among the rest of the population. At Bristol, although cases were, during the last two years, of constant occurrence among the Irish immigrants, there are several districts in which no cases have been met with. At Egg Buckland, near Plymouth, the repeated introduction from the town of convalescents from small-pox during the last epidemic led to no untoward result.

In November 1858, some 50 persons are said to have been affected with small-pox in the district of Newent. The first case was that of an engine driver, who had contracted the disease in the neighbouring

APPENDIX.

Nos. 1–4. *Local. Inquiries as to Vaccination.*

4. In Gloucestershire, Somersetshire, and Devonshire, by Dr. Sanderson.

town of Ross, and came home to the village of Linton, where he died. He had not been vaccinated. The only other death was that of a vaccinated child at Newent. In Berkeley district small-pox has been twice introduced since 1858, on the first occasion by itinerant showmen, when several persons who went to see the exhibition were attacked. On the second occasion, the disease did not extend beyond the family first invaded, but gave rise to an immense increase of vaccination. 342 persons underwent the operation, of whom 38 per cent. were above 12 years of age, and 80 per cent. above one year. In Midsomer district there was an outbreak in 1860 in the mining population of the village of Clandown, in which two unvaccinated children died. The district is well vaccinated both as regards quantity and quality. As the guardians declined to pay for re-vaccinations, none were returned, so that there was no marked increase of vaccination in the parish.

Inoculation.

At Bovey Tracey inoculation had been surreptitiously practised by a medical man (now dead) until a very recent period. In this district two severe outbreaks of small-pox have occurred, in which 24 persons lost their lives. Of these, 15 were unvaccinated, and nine had already had small-pox, either naturally, or by inoculation. None had been vaccinated.

In many parts of Somersetshire and Devonshire, the people manifest a great desire to have their children inoculated. Whenever a case of small-pox occurs in which they imagine the patient is "favourably taken," mothers bring their children for the purpose, hoping that, although the law forbids the practice, the doctor may be induced to yield to their request, or if not, that their children may at least be lucky enough to be infected with the real disease otherwise.

RECOMMENDATIONS.

In all of the Unions inspected, with the exception of Bristol, Tetbury, Wheatenhurst, Dulverton, and Torrington, the results of local inquiry were communicated in writing to the clerk for the information of the guardians. The guardians of Bristol Incorporation had already taken steps in the right direction. They had discouraged as much as possible the practice of domiciliary vaccination, and had resolved to effect a gradual reduction of the number of vaccinating stations. In Wheatenhurst, and Dulverton, it did not appear either that the existing arrangements required modification, or that any other measures could be taken by the guardians for the furtherance of vaccination. At Tetbury and Torrington I had the opportunity of explaining the necessary measures so fully by word of mouth, that a letter of recommendations seemed to be superfluous.

The suggestions offered to the guardians were for the most part precisely similar in character to those which I found it my duty to make in respect of the Unions visited in 1862. In all instances in which vaccination had been habitually neglected, I enforced upon the guardians the necessity of active supervision by means of returns of unvaccinated children prepared in each parish by the registrar, recommending that these returns should be furnished to the guardians at regular quarterly periods, in order to their being placed in the hands of the medical officer in charge of the parish for his report thereon, and that the guardians should be guided by this report in their further proceedings for the enforcement of the penalty. I have further pointed out that in order to ensure the success of this measure it is absolutely essential that the medical contractors should regularly certify to the registrars all vaccinations performed by them.

In three unions, viz., those of Cirencester, Stroud, and Barnstaple, in which I found that no contracts existed, I had the opportunity of

suggesting a complete re-construction of the vaccination arrangements, in accordance with plans which had been previously recommended in other Unions, and approved of by the Poor Law Board. In my communication to the guardians of Axbridge Union, I had occasion to point out to them in the strongest terms the evils which had arisen from the excessive subdivision of vaccination, more particularly in the rural districts. I recommended that the existing public arrangements should be re-considered and modified; that the number of contractors should be diminished, that each district should be confided to one performer, and that in the town of Weston a suitable station should be provided in some central situation, and should be made conspicuous by a board indicating the name of the contractor, and the day and hour of his weekly attendance.

In Keynsham Union I found that not more than one place for the performance of vaccination had been appointed by the guardians in each of the vaccination districts, and that in consequence many villages of large size being left without facilities for vaccination, parents were compelled to bring their children to considerable distances to the vaccinator's residence. I therefore advised that a station should be appointed in every populous parish in the Union, at which weekly attendance should be given as frequently as necessary, and that the arrangements embodied in the contracts should be modified accordingly.

In several other Unions, where it appeared to me that the existing stations were not adapted for their purpose, I recommended that others should be provided.

In one Union only, that of Williton, I thought it necessary to advert to neglect of duty on the part of the registrars.

MEMORANDUM of information given by medical practitioners as to the present occasional occurrence of natural cow-pox in the counties of Gloucester and Somerset.

Mr. Hancock, of Wedmore (Axbridge), sees cases of cow-pox communicated to the milkers every spring without exception, the vesicles very rarely extending beyond the margin of the hand which comes in contact with the teat in milking. He has made one experiment with vaccine lymph derived from the cow directly. The local effects were very severe, and the primary vesicle was surrounded with a crop of secondary vesicles, which soon became pustular, and were accompanied or surrounded with much hardness. The effects were so severe that Mr. Hancock has been reluctant to repeat the experiment. He promises to communicate with me next spring as to any cases of cow-pox that may come under his notice.

Mr. Leonard, of Dursley, tells me, that cow-pox appears in the dairies near Dursley about once in three years. During its prevalence the inoculation of the hands of the milkers is frequent. They often present themselves at the surgery with an eruption of vesicles round the grasping surfaces of the thumb and index finger, where the hand comes into contact with the teat in milking. Mr. Leonard has often opportunities of seeing the disease in the dairies, and also promised to communicate with me on the subject in the spring, if any dairies were infected.

Mr. Larke, of Rendcombe, Cirencester, took me to see a dairy about two miles from Rendcombe, supposed to be infected with cow-pox. I examined four or five animals. In all, the teats were beset with irregularly disposed vesicles and scabs. The vesicles were few, as compared with the crusts and scabs. They all appeared to contain an opaque liquid. The animals were restless, and difficult to get at, so that my examination was very imperfect. The disease was considered by Mr. Larke to be genuine cow-pox.

Mr. Ormond, of Westbury-on-Trym, Clifton, introduced vaccine lymph directly from the cow into his district about four years ago, and has since vaccinated continuously from this supply. He states that after the first transmission, the character of the vesicles obtained could not be distinguished from those resulting from ordinary lymph.

Mr. J. J. Evans, of Bristol, obtained vaccine lymph from the cow about 15 months ago. The first inoculation produced extensive inflammation of the arm, and vesicles larger than those of ordinary vaccination, but these unusual characters did not present themselves in subsequent vaccinations. Mr. Evans states that he has successfully taken lymph from the cow eight or ten times.

5. STATISTICS OF THE NATIONAL VACCINE ESTABLISHMENT.

1. STAFF of the ESTABLISHMENT at end of 1863.

N.B.—The Stations named in *italics* are Educational Vaccinating-Stations, authorized by the Lords of the Privy Council, for the purposes of their Lordships' Order of December 1, 1859.

	Members of the National Vaccine Establishment supplying Lymph for the Public Service.	Vaccinating Stations.	Days and Hours of Attendance.
Vaccinators salaried from the Parliamentary Grant.	Mr. John Newton Tomkins, *Inspector.*	Russell Place.	Mon., Tues., Wed., Thur., Fri., Sat.; 10—11.
	Mr. James Furness Marson.	*Surrey Chapel.*	Tuesday, Thursday; 1—2.
	Mr. George Lewis Cooper.	Battle Bridge.	Tuesday, Thursday; 12—1.
	Mr. Henry Sterry	Bermondsey.	Tuesday, Friday; 2—3.
	Mr. Robert Wade	Dean Street, Soho.	Monday, Wednesday; 12—1.
	Mr. Arthur Bernard Macann.	King Street, Portman Square.	Monday, Wednesday 10—11.
	Mr. Wm. Jones Lewis.	Spital Square.	Monday, Thursday; 10—11.
	Mr. George Simpson	*Tottenham Court Chapel.*	Monday, Wednesday; 1—2.
	Mr. Wm. Jones Lewis.	*Wellclose Square.*	Tuesday, Saturday; 9—11.
Parochial and other Vaccinators not salaried from the Parliamentary Grant, but furnishing Lymph at a fixed rate of payment.	Mr. Ellis Southern Guest.	*Manchester.*	Monday; 2—4.
	Mr. John Garner	*Birmingham.*	Monday; 10—12.
	Mr. William Yeoman Sheppard.	*Bristol.*	Tuesday; 10—12.
	Mr. Arthur Browne Steele Mr. John Henry Wilson Mr. John Fenton	*Liverpool.*	Friday; 2—3.
	Mr. Wm. Prue Jorden.	*Pimlico.*	Monday; 9—12.
	Dr. T. Fothergill McNay.	*Newcastle-on-Tyne.*	Thursday; 1—3.
	Mr. Edward Law Hussey.	Oxford.	Wednesday; 2—3.
	Mr. Henry Geo. Allanson.	*Sheffield.*	Tuesday; 3—4.
	Mr. William E. Grindley Pearse.	Westminster.	Monday, Thursday; 9—11.
	Mr. James George Gerrans.	*Marylebone.*	Monday, Thursday; 10—11.

Statistics of the National Vaccine Establishment—*cont.*

2. SOURCES and AMOUNT of LYMPH-SUPPLY in 1863.

N.B.—The Stations named in *italics* are Educational Vaccinating-Stations, authorized by the Lords of the Privy Council, for the purposes of their Lordships' Order of December 1, 1859.

Members of the National Vaccine Establishment supplying Lymph for the Public Service.	Vaccinating-Stations.	Number of Vaccinations performed at the Stations respectively.	Number of charges of Lymph supplied from the Stations respectively.	Remarks.
Vaccinators salaried from the Parliamentary Grant.	1. Russell Place	1,080	5,882	
	2. *Surrey Chapel*	1,896	14,730	
	3. Battle Bridge	971	11,585	
	4. Bermondsey	849	7,873	
	5. Dean Street, Soho	589	7,540	
	6. King Street, Portman Square	800	12,941	
	7. *Spital Square*	406	18,570	
	8. *Tottenham Court Chapel*	2,355	31,676	
	9. *Wellclose Square*	424	17,850	
Total	9 Stations	9,370	128,647	
Parochial and other Vaccinators not salaried from the Parliamentary Grant, but furnishing Lymph at a fixed rate of payment.	1. *Manchester*	1,413	11,354	
	2. *Birmingham*	1,204	8,775	
	3. *Bristol*	229	1,250	
	4. *Hull*	159	682	Discontinued in Novemb
	5. *Liverpool*	902	24,077	
	6. *Pimlico*	1,980	1,682	
	7. *Newcastle-on-Tyne*	520	25,385	
	8. Oxford	57	223	
	9. *Sheffield*	868	13,115	
	10. Westminster	2,350	18,558	
	11. *Marylebone*	1,548	5,684	
Total	11 Stations reduced during the year to 10	11,230	110,785	
General Total	20 Stations reduced during the year to 19	20,600	239,432	

Nos. 6, 7. *Conditions of Nourishment.*

No. 6.—REPORT by DR. EDWARD SMITH on the FOOD of the POORER LABOURING CLASSES in ENGLAND.

6. Food of lowest-fed classes, by Dr. E. Smith.

PRELIMINARY STATEMENT.

The Lords of Her Majesty's Council having been pleased to direct that enquiry should be made into the exact dietary of low-fed populations in this country,—an enquiry of national interest, and the first attempt which has been made in any country to ascertain the national dietary,—I have now to report to you, for the information of their Lordships, the results which have been obtained.

Object of the enquiry.

In the exercise of the discretion which was entrusted to me in the selection of the persons who should be regarded as belonging to the large class just mentioned, I was guided by the facts that the object which their Lordships had in view was not a physiological one, to ascertain upon how small an amount of food persons might live, but a social and national one, to demonstrate upon what food large masses of the population do live, and also that the condition of the agricultural labourer should specially be ascertained.

Fundamental conditions.

With regard to the persons to be examined, it seemed that the following should be fundamental conditions of the enquiry :—

1st. That the persons should always, or nearly so, live by their labour.
2nd. That their occupation should be one of a defined character, and of sufficient importance in the community.
3rd. That their earnings should, under all circumstances, be small.
4th. That they should be such as in industry, thrift, intelligence, health and capability for labour, and general employment would fairly represent the class of which they were members.

The 3rd and 4th conditions were rendered necessary by the fact, that if there were much diversity in the amount of food obtained it would be impossible for me to ascertain the average amount, and this would occur in the class with general abundance of food, whose wages might be high at one period and low at another, as well as in that with general defect of food, in which there was lack of occupation for lengthened periods, or dissolute or unthrifty habits. Moreover, as the enquiry was essentially one of dietary, and did not embrace questions of health and general sanitary conditions of the operatives and their families, it was necessary to avoid cases where inability to labour and to obtain sufficient nourishment resulted from general ill-health. Hence the greater number of the cases were persons in the ordinary state of health of the class in the localities where the enquiries were prosecuted.

The general idea was to select persons who were collected together in classes, not simply by community of want, (since such might be composed of the most heretogeneous materials, and have nothing further in common,) but by community of conditions such as are met with in the masses of our labouring people.

Classes selected.

Of the town populations fulfilling these requirements I have selected silk weavers and throwsters, needlewomen, kid glovers, stocking and glove weavers, and shoemakers; and of country populations I have restricted myself to agricultural labourers.

The localities which I have visited have been such as afforded the class of persons in the largest numbers, and such as exhibited any well-defined difference in the details of each occupation or in the general condition of those occupied.

Selection of families.

The persons subjected to the enquiry have been for the most part pointed out to me by medical or other gentlemen well acquainted with the localities, and from them I have chosen the suitable cases; and when I have been compelled to make the selection myself, I have been strictly guided by the conditions already laid down. The numbers have

been such as in my judgment would afford average results of the whole; but they have necessarily been limited by the time allotted to the enquiry.

As the nature of the enquiry was closely allied to that which I had the honour to make among the Lancashire operatives, and which was published in your last report, I prepared a similar set of queries, modified so as to include every article of food which the difference in occupation and situation might induce. As the questions were of a private nature, and would be impertinent if not made in confidence and for the public good, I thought it due to the questioned, and conducive to correct answers, to state, in all cases, the public nature of the enquiry, and its entire dissociation from any local object. I think it not a little creditable to the good sense and honesty of our countrymen to state, that in not more than perhaps half a dozen instances have I met with a refusal or even reluctance to give the required answers, and such instances I excluded from the enquiry.

Mode; and

But, with an universal readiness to give answers to the questions, there was often a difficulty in obtaining a statement of that fair average dietary which it was my purpose to seek. This arose from several causes:

difficulties of the enquiry.

1. In no occupation is the income precisely the same throughout the year, owing either to variations in the amount of employment of the head of the family and to the remuneration obtained for it, or to the temporary occupation of other members of the family at certain seasons of the year.
2. There is variation in the kind of food to be obtained according to the season of the year, by which new elements of dietary are introduced, and old elements are in part or wholly displaced. Such, for example, as the production of vegetables, and the abundance of fish, and also in a less degree the abundance and consequent cheapness of butter and milk, from which either a greater amount of that kind of food may be then obtained, or the sum of money thus saved may be expended in other necessaries.
3. The difficulty which exists in the minds of the labouring classes in forming an average upon any subject, and particularly in reference to certain parts of the subject in question, in which minor articles of food, as rice, peas, and fish, were purchased at irregular and distant periods. This varied much, and was the greatest perhaps in the purely agricultural districts of England and in Ireland, and the least in Scotland.

To overcome these difficulties I found it necessary to exercise patience and tact, and to suggest such help as my knowledge of the quantities of food usually consumed, and their value, enabled me to offer. Upon the question of averages I decided to select that dietary which would represent the more normal condition of things, (avoiding either extremes, where such existed,) and the season of the year during which the enquiry was made facilitated such a result, and also to ascertain the quantity of food taken at the period of the enquiry.

Mode of estimating the average dietary.

In the less important foods, as rice and peas, I thought it wise to endeavour to obtain an approximate average for the whole year, making the enquiry on the average of the month rather than on that of the week; but in the essential foods, as bread, flour, and potatoes, I found it necessary to take the combination of them then existing in the dietary, since it was generally impossible to determine how much one of them would be diminished in quantity when another was increased. In some instances, however, I was enabled to obtain alternative dietaries, as in Ireland, where at one season maize, and at another potatoes, is exclusively eaten. In reference to bacon, meat, and fish, I endeavoured to

Value of the answers.

obtain an average upon the year. The statement of the quantity of milk obtained in England and Ireland is somewhat higher than would be found on the average of the year (and especially in the country districts), since the abundant supply rarely extends over more than 8 or 9 months in the year; but in the northern part of Scotland, where the idea of an average is a leading feature of the mind, and where the supply of milk is almost limited to six months of the year, I have taken the average upon the whole year.

As a general expression of the conviction of my own mind, it may be stated, that, notwithstanding the privacy and difficulty of the inquiry, *first*, the answers obtained are truthful, and worthy of perfect credence, *second*, the dietaries indicate the ordinary average food obtained by the classes referred to, being (particularly in the case of the agricultural population) somewhat better than is obtained in mid-winter, and not quite so abundant as that obtained in mid-summer.

Income; and

The question of income only incidentally affects this inquiry, for if the amount of food consumed can be ascertained, it may be safely assumed that the income is sufficient to pay for it. Moreover, from the variations in the income, resulting from conditions already mentioned, it is less easy to obtain a correct average of that than of the food obtained from it, since the latter, with all its variations, is a more uniform and constant quantity. At the same time I have endeavoured to determine this question also, and to show how much of the income is due to the head and how much to the other members of the family; and the tables will show how fallacious it is to estimate the income of the family by that of the head only. This is particularly the case in country districts where trade employment is obtainable, as in the case of coal, stone, and other mines, of brickmaking, of railways, and docks, for men; and of lace and glove making, of straw plaiting and washing, for women; and as a general expression it may be stated, that the condition of the labouring classes is far better in such than in purely agricultural localities.

relation to food.

Moreover, the amount of food which is obtained may not be measured by the monetary income of the family, since throughout the agricultural districts, and in many places near small towns, vegetables are grown by the labourer at a cost much below their market value, for the rent of the land, with his own labour, which could not be otherwise of monetary value, is all that the products cost. Hence this advantage must be added to the monetary income. In many places some articles of food, as skimmed milk and buttermilk, are given to the labourer; and in cases of temporary distress the hand of the philanthropist is now widely extended, but to a degree which cannot be estimated; and further, in many localities, the monetary income is only a part of the usual wages obtained.

Rent.

I have not been able to direct my attention to other questions of household expenditure, except that of house rent, and the accommodation obtained by it; but I purpose to make reference to the latter question.

Mode of estimating nutritive value of foods.

Carbon and nitrogen.

Computed adults.

As in my report upon the dietary of the Lancashire operatives, and for the reasons therein contained, I have calculated the nutritive values of the foods in the separate dietaries upon the contained carbon and nitrogen only; but in addition to the information then obtained, I have ascertained the number of persons above and below ten years of age respectively in each family, and have computed the nourishment per head as well as per family; and further, as comparisons can only be made between persons in the same conditions, and as adults only can be selected for this purpose, I have endeavoured to estimate the value of adults, and have computed that two persons under ten years and one person above that age shall be regarded as an average (M.F.) adult. It is confessed that this

is an arbitrary estimation, and may be erroneous, when there are very young children in the family, or when the age of one of them happens to be about ten years; yet when it is considered, on the one hand, that children at the period of growth from 10 to 14 years of age require a very large amount of food, we shall not err far in considering them as equal to a man who has passed the middle of life, and on the other, although two very young children would not consume so much food as a man, yet in every family with several young children some must be approaching the age of ten years, it is probable that the estimate derived from the different ages may not be far from the truth. However, I do not think that a more correct approximation to the truth can be made than that now adopted; but in order to meet the views of any who object to so artificial a computation, I have also included the other alternative above referred to. In the analysis of the tables I have usually made use of the computation per adult, so as to enable me to compare single persons with families, and families of different ages together.

Free hydrogen.

But although I think it unsafe to include the calculation of the free hydrogen in that of carbon when the object is to compare the quantity of food obtained with that which is inferred to be necessary from the products of nutrition and disintegration which are found in the excretions, it has of late years been so much the habit of chemists when speaking of the carbon in food to add to it the free hydrogen reckoned as carbon, that for the purposes of comparison with other investigations I have added *in the total quantities* the amount of free hydrogen reckoned as carbon, so that the whole may be added together by any one desiring to do so.

Division of the enquiries.

With these preliminary observations I proceed to state the results which have been obtained, and shall divide the enquiries into two classes:—

1st. Those which refer to in-door occupations;

2nd. Those which refer to out-door occupations.

The former will include silk weavers, needlewomen, kid glovers, stocking and glove weavers, and shoemakers, and consists of town populations, except in the case of the stocking weavers. The latter includes farm labourers only.

1. IN-DOOR OCCUPATIONS.

Silk weavers and throwsters.

Preliminary questions.

The enquiries among this class were made at Spitalfields, Bethnal Green, Coventry, and Macclesfield, and include the cases Nos. 1. to 42. in the Appendix.

This class under ordinary circumstances somewhat contravenes one of the conditions of the enquiry, since at periods of full work the income obtained is large, whilst at other times there is a prolonged absence of employment and income. The prostration of the trade, for many years past, has, however, so lessened the period of full work, that the income obtainable is not higher than that of any low-fed population in this country, and, except for the difficulty which exists of forming an average of food and income, it is most fitted for this enquiry.

The labour is performed on the upper floor of the house, where there is much light, and where ventilation might be good. In Spitalfields the houses are large, and have many occupants, and the atmosphere is warm and close; whilst in the other localities, the houses being smaller, are for the most part inhabited by one family, and the ventilation is

less defective. The wife and the elder children are enabled to work the loom or wind the silk, and hence several members of a family aid in obtaining the weekly income. The general statement made by the people themselves as to their health is that it is good, but they are of very spare habit. The colour of complexion varies much, so that whilst pallor is not unfrequent, it is more usual to find the skin thin, and the complexion somewhat florid. It is probable that the descent of the Spitalfields weavers may have influenced their aspect, but whether from acquired constitution, or the influence of hygienic conditions, silk weavers as a whole are a sensitive and feeble race.

Number of enquiries.

The enquiries have comprehended 42 families, including 244 persons and 198½ computed adults.

Nutriment obtained.

The total average amount of nourishment obtained by them was 27,620 grains of carbon and 1,151 grains of nitrogen weekly for each computed adult, and so uniform was this average in the four localities referred to, that in only one (Bethnal Green) did the quantity of carbon exceed 28,000 grains, and in only one (Macclesfield) was the quantity of nitrogen less than 1,100 grains weekly.

Bread stuffs.

The articles of food used by them under the head of bread stuffs were bread, flour, peas, and rice.

In ½ of the cases flour was not purchased, and of those the greater number lived in Macclesfield. In ¼ of the cases bread was baked at home, and these lived exclusively in Macclesfield and Coventry, so that ¾ of these communities bought bread which had been baked for them. Oatmeal was purchased by ⅓ of the people, in quantities averaging from ½ to 2½ lbs. weekly, per family. Peas were consumed by ⅔ and rice by ½ of the people, but, with three or four exceptions, in very small quantities, at irregular intervals, and chiefly in the winter season. The average quantity of these bread stuffs reckoned as bread was 9½ lbs. per adult weekly, the largest quantity being in Bethnal Green, and the smallest in Macclesfield.

Case No. 2. stated that in periods of plenty the quantity of bread alone consumed per week would be increased from 28 lbs. to 42 lbs., and many expressed their belief that bread was a cheaper food than potatoes.

Fresh vegetables.

Potatoes were eaten in 4⅔ and succulent vegetables in ⅓ of the families, and the average quantity of the former was 10¼ lbs. per family, or somewhat over 2 lbs. per adult, weekly. In Coventry only did any of the families have gardens.

Sugars.

Of separated sugars, treacle was eaten by 25/42 families, and those chiefly residing in Macclesfield and Coventry, whilst sugar was purchased in every case except one. In no instance did the use of treacle supplant that of sugar, but it was used chiefly instead of butter.

Case No. 9. remarked that treacle exerted a laxative action upon the children, and there was a general belief that it was not an economical food. The average weekly consumption of both was 2¼ lbs. per family and 7¼ oz. per adult.

Fats.

One or other of the kinds of fat recorded in the tables was used in every case. In only three instances was butter not consumed, whilst the omissions in the use of dripping and lard or suet amounted to ½ the cases, and those chiefly at Macclesfield.

The average consumption of fats weekly was 1¼ lbs. per family and 4½ oz. per adult, with a considerable increase at Bethnal Green.

Meats.

Meat was eaten weekly by ⅔ of the people. In Spitalfields and Bethnal Green there were no omissions, but in Macclesfield 1⅓ and in Coventry ⅙ never obtained meat. Bacon was eaten in quantities varying from ¼lb. to 2 lbs. weekly by ⅔, and butchers' meat in quantities

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varying from ½ lb. to 6 lbs. weekly by ⅔ of the families. The quantity per adult varied much in these localities, and was, weekly, 14·8 oz., 9·4 oz., 5·3 oz., and 3·25 oz., at Bethnal Green, Spitalfields, Coventry, and Macclesfield, in their order. The total average was a little over 2 lbs. per family per week.

It must be remarked that the use of meat depended much upon the amount of employment obtained, so that in a family ordinarily well to do (No. 4.) the quantity would be 3 lbs. in bad and 7 lbs. in good times, weekly. There were also numerous instances in which meat was not obtained every week, but once in two or three weeks, and in such the quantity has been averaged per week. Moreover, when obtained, it was not usually distributed throughout the week, but was provided for the Sunday's dinner, and might then be all eaten, or a portion left, which would serve for one, two, or three days of the week. In only the most thrifty families conjoined with an approach to sufficiency of income (No. 13.) was the meat distributed over all the days of the week. There was a general dislike to the fat of meat. Further, there was a prevalent desire in the population of Spitalfields and Bethnal Green to obtain sapid food, such as cooked fish, herrings, trotters, stewed, and eaten with the broth, cockles, shrimps, sausages, black puddings, pickled pork, liver and bacon, many of which contained but little nutriment, and in none could the weight be fairly ascertained and the nutritive value estimated. Bacon was selected, not alone because it was sapid, but because the dripping which ran from it could be given to the children, whilst the bacon itself would be eaten by the adults. For this reason many preferred the English to the American bacon, although its cost was much greater. An economical as well as agreeable dish was a sheep's head cooked by baking for the Sunday's dinner, and reserving the dripping for use throughout the week. Others selected the breast of mutton, to be prepared in the same way.

Fish. Fish, including herrings, was not regularly consumed by these populations, since in only $\frac{1}{44}$ of the cases could the quantity be estimated. The fish was usually plaice or whiting when purchased uncooked, and always plaice when purchased cooked, and the herrings were for the most part dried.

Milk. The total average quantity of milk eaten per family was 4½ pints, and per adult 1·1 pint weekly, with a great increase in the population of Macclesfield. The average quantities were, per adult, 1·6 oz., 7·6 oz., 11·5 oz., and 41·5 oz., at Bethnal Green, Spitalfields, Coventry, and Macclesfield, in their order. New milk was almost exclusively obtained in London, whilst skimmed milk was usually purchased in the other localities. Buttermilk was eaten at Macclesfield by $\frac{4}{13}$ of the families, but whey (which was affirmed to be laxative at Coventry) was eaten by only two families.

Cheese. Cheese was eaten in very small quantities by about one half of the families, and chiefly by the husbands.

Eggs. Eggs were rarely obtained.

Tea. The use of tea was almost universal, there being but one exception, whilst coffee was consumed by somewhat more than one half of the families. The quantity of tea per family was 2 oz., and per adult 0·43 oz., with an increase so considerable in the London population as an average of 3·6 oz. per family at Spitalfields.

Coffee.

Cocoa. Cocoa was sometimes purchased.

Beer. Beer was drunk by nearly all ($\frac{15}{16}$) of the London families, whilst it was not drunk at all in Macclesfield, and very rarely at Coventry. The quantity was nearly 5 pints weekly per family in London, of those who drank it. Weak beer was only drank by one family, and cyder was not used at all.

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The total cost of the food obtained weekly by these populations was 10*s.* 2½*d.* per family, and 2*s.* 2½*d.* per computed adult; varying from 1*s.* 8½*d.* per adult at Macclesfield to 1*s.* 11½*d.*, 2*s.* 5½*d.*, and 2*s.* 9¼*d.* at Coventry, Spitalfields, and Bethnal Green. The economy with which this was expended is strikingly shown by the amount of nourishment which a given sum purchased at the different places. Thus for 1*s.* the total average amount of carbon and nitrogen obtained was 12,769 and 476 grains, but the variation in the averages of the different localities amounted to 60 per cent., as follows:

	Carbon.	Nitrogen.
Spitalfields	- 11,042 grains.	374 grains.
Bethnal Green	- 10,272 „	412 „
Coventry -	- 13,765 „	520 „
Macclesfield	- 16,008 „	600 „

Cost of food and proportion to the nourishment obtained.

The costly character of the dietary in London is not to be so much attributed to the relative prices of the foods in town and country as to the selection of foods, which cost much in proportion to the nutriment which they afford, such as sugar, fats, meat, and tea; whilst the cheapness of the dietary at Macclesfield is to be attributed to the lessened supply of these articles, and to the increased use of bread stuffs, skim milk, and butter milk.

Causes of variation in the different localities.

It must, however, be added, that the habit of the poor in buying the food in very small quantities, as for example bacon by pennyworths, and tea by ¼ ounces daily, causes a waste of money which will be the greatest where the habit the most prevails, and where the greatest number of such articles are consumed. Such is doubtless more the case in London than the country localities referred to.

Meals.

Three meals were eaten in times of ordinary comfort, but when there was great deficiency of income only two were taken. The foods eaten at the meals in some of the cases was as follows:

No. 18., Macclesfield. *Breakfast*:—Parents, tea, bread, and butter. Children, milk porridge. *Dinner*:—Oatmeal pudding, milk and bread. *Tea*:—Tea, bread, and butter. No. 23. *Breakfast*:—Coffee and bread. *Dinner*:—Bread and cold meat. *Tea*:—Coffee and bread, or bread and milk. No. 35. Coventry. *Breakfast*: 8 A.M.: Tea and bread, butter or sugar very rarely. Children at mid-day have a little bread. *Tea*, 3 P.M.: Tea, bread, and treacle. No. 37. *Breakfast*:—8 A.M. Coffee, bread and dripping, and children have one pint of milk. *Dinner*:—1 P.M. Meat daily, with broth and bread, and on Sundays a fruit or suet pudding. *Tea*:—4 P.M. Tea, bread and dripping. *Supper*:—9 P.M. Coffee, bread and dripping. No. 38. *Breakfast*:—Children have bread and treacle, adults have tea or coffee, and bread with lettuce, perhaps. *Dinner*:—Bacon and potatoes, and in this case the bacon and potatoes are boiled together, and the water is thrown away! *Tea*:—Tea and bread. *Supper*:—Bread and cheese.

As a general expression it may be stated that the breakfast at about 8 A.M. consists of tea or coffee, with (sometimes without) milk and sugar, and accompanied by dry bread, or bread and butter, dripping, or treacle. The dinner at 12 to 1 P.M. is the best on Sundays, when meat, potatoes, green vegetables, or dry peas, suet or other pudding, and bread, are provided. On week days pudding is seldom prepared. Unless there be any meat it is not usual to have potatoes; and if there be any fat, cabbage is sometimes fried in it. In some instances in London suet and currant pudding is provided in the absence of meat. The meat is not unfrequently cooked in a pudding or pie. Tea is sometimes, but not generally, taken with dinner, when meat or fresh vegetables are cooked, but only when the dinner consists of bread or bread

and treacle, or of pudding. The tea is a meal similar to the breakfast; and supper, consisting of cheese and bread for the husband, and cocoa, coffee or tea, with bread and fat, for the other members of the family, is common in London.

In London a somewhat singular plan is pursued in reference to the food of children working away from home. Instead of taking food with them, which the mother has prepared, each child is furnished with 1½*d.* or 2*d.* per day for dinner, and of this 1*d.* is usually spent in pudding, and ½*d.* in potatoes, at a cook shop. When the amount to be expended is 2*d.* the customer is allowed to sit down, and have a little gravy or fat added to his meal.

The principal solid food obtained is bread, and the aim is to obtain fat or treacle to eat with it. Fresh vegetables are adjuncts to other foods, and the desire is to obtain some kind of meat, and that being impossible, some portion of fat to eat with them. Of fluids tea and coffee are the most frequent. In a few instances in Spitalfields the tea leaves and coffee grounds had been given by a thoughtful and richer neighbour.

Thus, on a review of this part of the enquiry, it may be stated:—

1st. That these populations have a precarious and uncertain dietary.

2nd. That the variety of foods in use is considerable, but the quantity small.

3rd. That the most economical selection of foods is found in the country, and that the system pursued in towns is not conducive to the good nutrition of the body.

4th. That the largest income and the largest amount of nutriment is obtained at Bethnal Green, whilst the contrary conditions exist at Macclesfield.

5th. That they are as a whole insufficiently nourished and of feeble health.

6th. As typical cases I select No. 3. for respectability and good management; No. 27. for respectability and great economy; and No. 6. for an instance of a large family of children very spare of habit, but of rosy complexion, living upon a very small quantity of food.

Needle-women.

This is the lowest-fed class included in my enquiries, and demands yet more extended investigation. They differ from other populations now under discussion in not having been trained to their occupation as a means of living from early youth, but have embraced it when other means of living failed. Hence they are a heterogeneous class, consisting of persons who have followed some previous occupation, who vary much in ability for the work, who may have suffered in health from previous want, and who are not in good health, or who are advanced in life. Hence, community of want constituted them a class, and similarity of employment continued it. There is therefore much diversity in the bodily powers, health, skill, capability to labour, and income, and thence equal diversity in the amount of food which they can procure, and in the amount which the body can appropriate. These causes of irregularity rendered it most difficult to obtain a statement of an average dietary, and, when it has been obtained, to compare the results one with another, but, in addition to this, the hand of charity is now largely extended to them, and food, or its equivalent, is, however unfrequently, given to them beyond the amount of their earnings.

The class of needle-women comprehends many branches, and for its complete investigation would have occupied much time, so that in order

to keep the present enquiry within due limits, I restricted myself to those who are congregated in or are attached to institutions having a philanthropic as well as commercial character.

In all instances the lodgings were limited to one or two rooms, which were for the most part in crowded and somewhat low neighbourhoods. In this or these they remain nearly all the day, and in many instances must labour from daylight to a late hour in the night. Hence the hygienic conditions in which they are placed are unfavourable to health, and the anxiety which almost everywhere attends them further tends to injure their health. The enquiry has been limited to London, but has extended to many parishes both on the east and the west. It has comprehended 31 families, including 52 persons, and 47 computed adults.

Number of enquiries.

Nutriment obtained.

The total average quantity of carbon and nitrogen contained in the weekly dietary was 22,900 grains, and 950 grains for each computed adult, and as the majority of these persons were over the age of 20 years the mode of computation gives the highest possible quantity of food. The average income was only 3*s.* 11½*d.* weekly per adult, but that was influenced both by the amount and kind of work which they could obtain. Cloth work enables them to earn 7*s.* to 14*s.* per week. In every department there was the complaint of insufficient work, so that sometimes they remained unemployed for weeks together.

Bread stuffs.

Bread was universally purchased already baked, but in $\frac{1}{31}\frac{1}{4}$ cases a little flour was procured for the Sunday's pudding. Oatmeal in very small quantities was procured by $\frac{1}{8}$, peas by $\frac{1}{15}$, and rice by $\frac{1}{10}$ of these populations, so that bread was almost the sole representative of this class of foods eaten by them. The total average quantity of bread stuffs consumed was 7¾ lbs. per adult weekly. It was not unfrequently found that the needle-woman received aid from the parish, which comprised a loaf of bread, and this was made the basis of the weekly dietary, other elements of food being added as the variable income might permit.

Fresh vegetables.

Potatoes and green vegetables were very generally obtained, the former in $\frac{9}{10}$ and the latter in $\frac{8}{9}$ of the cases. The average quantity of the former per adult was 2½ lbs. weekly. In cases where more potatoes were eaten less bread was purchased. In some instances 2*d.* worth of potatoes were purchased daily, and cooked with fish or bacon, for the evening meal (Case No. 70.)

Sugars.

The average weekly consumption of sugars was 7¼ oz. per adult, and this contained treacle in only five instances. Sugar was usually purchased by ¼ lb. at a time, and in some instances that quantity was obtained daily.

Fats.

Fats were obtained in small quantities, and included all the kinds recorded. Butter was selected in all cases except two, and was the sole kind of separated fat used in $\frac{1}{3}\frac{1}{4}$ of the cases. Dripping and suet were each obtained by $\frac{1}{3}$, and in a few instances dripping was the only fat purchased. The total quantity of these separated fats was only 4½ oz. per adult weekly.

Meats.

Butchers' meat or bacon was obtained in every case on the total average of 16¼ oz. per adult weekly. In $\frac{1}{8}$ of the cases butchers' meat and $\frac{1}{2}$ of the cases bacon was not obtained, but both kinds of meat were consumed by ¼ of the cases. Some persons purchased 2 oz. of meat for 1½*d.*, and others 2 oz. of bacon daily; others obtained ½ lb. of bacon daily, or ½ lb. of cooked meat three times a day, with ½ lb. on Sundays. Others, still, purchased for Sunday's dinner 1*d.* of sheep's brains, and when meat could not be obtained it was usual to buy 1*d.* of black pudding for dinner or supper. A few persons received the gift of a meat ticket occasionally, and some had relations who were accustomed to invite them to partake of their Sunday's dinner.

Fish, including herrings, was eaten by $\frac{13}{31}$ of the families. The fish was for the most part cooked, but some (Case No. 70.) purchased cod-fish tail. Fish.

New milk was purchased by about $\frac{1}{3}$ of the cases, but often to the extent of only $\frac{1}{4}d.$ worth per day. Skimmed milk was used by only one family, while buttermilk and whey were not obtained at all. The average quantity of milk was only seven fluid ounces per adult weekly. Milk.

Cheese was taken in very small quantities by $\frac{7}{31}$ of the cases, and eggs were sometimes obtained for the children, or when bacon could not be purchased. Cheese.

Tea was drank in every case but two, and in quantities quite disproportionate to its nutritive value and the income of the purchaser. The total average amount was 2 oz. per family and $1\frac{1}{4}$ oz. per adult weekly. Some (Cases Nos. 70. and 71.) purchased $\frac{1}{2}$ oz. daily. In numerous instances it was drunk thrice a day, and particularly when the diet was restricted almost exclusively to bread and butter. Coffee was used by about $\frac{1}{5}$ of the cases, and, with one exception, in addition to and not in place of tea. Tea. Coffee.

The ordinary quality of beer was drank by $\frac{13}{31}$ of the families, in weekly quantities varying from $\frac{1}{2}$ pint to 1·4 pints. Beer.

The cost of the food obtained was 2*s.* 7*d.*, per adult weekly, and the amount of nutriment purchased for 1*s.* was so little as 8,860 grains of carbon and 336 grains of nitrogen. Cost of food and relation to nutriment purchased.

The following conclusions may be drawn :— Conclusions.

1. Needle-women are a very mixed class of persons.
2. The determination of their exact dietary is very difficult.
3. They are exceedingly ill fed, and show a feeble state of health.
4. The amount of money spent in food is very ill spent.
5. The subject would repay more extended investigation.

Kid Glove Stitchers.

Preliminary questions.

The manufacture of kid gloves extends over a large area in the south of England, and finds occupation for the wives and daughters of farm labourers, and for many persons, both male and female, as a sole means of living. I have selected Yeovil because it is the principal seat of this trade; and as there is much difference in the wages which men and women may earn, I have limited my enquiries to the cases of women engaged in stitching or buttoning the gloves.

The stitching is effected by placing the two sides to be stitched together in a kind of clamp, which stands upon the floor in front of the stitcher, the upper edge of which is grooved at regular intervals to receive the needle, and to render the stitching uniform. The position of the body is that of sitting and leaning forward; and as close attention is required, and much work has to be performed by a most inefficient artificial light, the stitcher stoops, and places her eyes very near to her work. Hence contraction of the chest, displacement of the lungs backward, deficient respiration, and impaired eyesight, commonly follow. To these evils must be added that of long hours, for only 3*s.* 6*d.* is paid for seaming the backs of a dozen of kid gloves (the price of the same work differing somewhat with the different employers); and in order to obtain a living all must work 12 hours daily; Case No. 82. worked from 6 A.M. to 11 P.M. to obtain 5*s.* 6*d.* per week. It was lamentable to see children from 9 to 14 years of age kept at this employment during the whole day, seeing nothing of the world around them, and cut off from the amusements and exertion so natural to children, and so necessary at the period of growth.

IN-DOOR OCCUPATIONS.

KID GLOVERS.

Number of enquiries.

The general state of health was not good. The women and children were commonly pale, and had thin sensitive skins, and when they were not emaciated they were weak. The necessity for frequent attendance at the warehouses in all weathers caused much loss of valuable time, and exposure to cold and disease, and led from admixture of the sexes to habits of profligacy. The needle-women of London did not impress my mind so unfavourably as the stitchers of gloves at Yeovil, since the former were for the most part in middle or advanced life, whilst here were children or young women who were consuming their health and losing the pleasures of life for the barest pittance.

Besides the cases now to be analysed there were others which are recorded in the families of agricultural labourers.

The number of families now referred to are 10, including 22 persons and 19 computed adults.

Nutriment obtained.

The total average quantity of carbon and nitrogen obtained weekly was 28,623 grains and 1,213 grains.

Bread stuffs.

Bread already baked was purchased in every instance, and flour was obtained as a supplemental food by $\frac{8}{10}$ for the purpose of baking cakes. Rice was used by Case No. 79. thrice a week, but in no other instance was it or oatmeal or peas purchased. The total average quantity of bread stuffs eaten weekly was $8\frac{3}{4}$ lbs. per adult.

Fresh vegetables.

Potatoes were obtained by every family in an average quantity per adult of $5\frac{1}{2}$ lbs. and other fresh vegetables were eaten once or twice a week by $\frac{7}{10}$ of the families.

Sugar.

Sugar was eaten by $\frac{8}{10}$, but treacle was not purchased at all. The average quantity per family was $\frac{1}{2}$ lb. and per adult $4\frac{1}{4}$ ounces weekly. Butter was procured by every case. Dripping also by $\frac{1}{3}$ and suet by $\frac{1}{5}$ of the cases. The average quantity of all the separated fats which were eaten per adult was 7 lb. weekly.

Meats.

Meat of some kind was eaten by every case, but butchers' meat was obtained by only $\frac{7}{10}$, whilst bacon was eaten by every family except one. The total average quantity of meat consumed weekly was $21\frac{1}{2}$ ounces per family and $18\frac{1}{4}$ ounces per adult. As in other poor communities, the meat was often obtained at very irregular intervals; some purchasing a little meat twice a week, and others (case No. 75.) having only $\frac{1}{4}$ lb. of bacon twice a month.

Fish.

Herrings or other fish were most rarely eaten.

Milk.

Milk was obtained by $\frac{7}{10}$ of the families, $\frac{1}{2}$ of the cases purchasing new and $\frac{1}{2}$ skimmed milk. The average quantity was $1\frac{3}{4}$ pints per family, and $18\frac{1}{4}$ fluid ounces for each adult.

Cheese.

Skimmed milk cheese, costing about 3*d.* per lb., rich in nitrogen, but doubtless difficult of digestion, was eaten by every case on an average of about 19 oz. per family and 10 oz. per adult.

Eggs.

Eggs were obtained by $\frac{1}{2}$ of the families only, and of these one kept fowls from which were obtained and eaten 12 eggs weekly on the average of the year.

Tea and coffee.

Tea was consumed by every family except one, whilst coffee was not drunk at all. The average quantity of tea was about $1\frac{3}{4}$ oz. per family and ·9 oz. per adult weekly.

Beer.

Beer of the ordinary quality was drunk by four-tenths.

Cost of food, and relation to nutriment purchased.

The total average value of the food obtained by each adult weekly was 2*s.* $9\frac{1}{2}$*d.*, and this yielded 10,231 grains of carbon and 434 grains of nitrogen for each 1*s.*

Meals.

There were generally three or four meals daily. Case No. 74. prepared bacon and vegetables for dinner; No. 79. meat and vegetables; and No. 81 either bacon or meat and vegetables, for the same meal. Cases Nos. 82. and 83. cooked bacon and potatoes four days a week, and on other days ate bread and butter or bacon and cheese for dinner. No. 82.

ate bread and cheese for supper, whilst No. 83. rarely obtained any supper.

Nos. 6, 7. *Conditions of Nourishment.*

Tea (sometimes cocoa) was taken for breakfast and tea, and only at dinner when the food was cold.

The following conclusions are arrived at:

6. Food of lowest-fed classes, by Dr. E. Smith.

1st. The occupation is an ill-requited and unhealthy one, and must produce unfavourable results upon the body, mind, and morals of female children, and upon the women generally.

2nd. The class is ill fed and unhealthy.

IN-DOOR OCCUPATIONS.

3rd. The money expended upon food does not obtain the amount of nourishment which it might obtain.

KID-GLOVERS.

Stocking and Glove Weavers.

Conclusions.

STOCKING AND GLOVE WEAVERS.

Preliminary questions.

These populations for the most part live in villages and small hamlets, and pursue their occupations on small looms called "frames" in their own houses. Others, but a comparative few, are engaged in large factories where the weaving is carried on by steam power; but it is only among the former that my enquiries have been prosecuted.

The wife and female children are enabled to help the weaver either by winding the yarn and seaming the goods, or by weaving in the frame, and thus add to the family income; whilst in the localities in which these processes are carried on the boys find other and more profitable employment, as in brick making, boiler making, coal mining, and iron smelting. Numerous instances occurred to me in which the income derived from the labour of the children equalled that of the father, and some in which the latter was trebled and quadrupled.

But the stocking weaver who supports himself and his family, if he have one, by his own labour, even with the aid of the female members of the family, is always a poor man, ill fed and ill clad, and without provision for the future. He is obliged to labour from early morning to a late hour at night, and although he may make 7 doz. (Case No. 96.), or 12 doz. (Case No. 98.), or 15 doz. (Case No. 101.) of gloves per week, according to their quality and his expertness, he cannot earn more than from 6*s.* to 15*s.* per week. In numerous instances I found that gloves were made complete at 1*s.* 3*d.* per doz., and of that sum half was expended in winding, stitching, and frame rent. The average income of the weaver himself in the enquiries which I have prosecuted was 9*s.* per week, whilst the average income of the whole family was 16*s.* 10½*d.* per week.

The houses in which these populations live, in hamlets, are small, and are usually occupied by one family. They are for the most part ill built, with brick floors, and ill fitting doors and windows, so that whilst there is abundant ventilation the houses are cold.

The health is represented by themselves to be good in general, but whilst they are not so spare in body as silk weavers, they are more generally pallid, and the wives complain of feeble health.

Localities visited, and number of enquiries.

The localities visited were Kilburn, Coxbench, Horsley, and Horsley Woodhouse, Smalley, Heanor, and Ilkeston, in Derbyshire, and the enquiries were made in 21 families, comprehending 131 persons and 104 computed adults.

Nutriment obtained.

The total average amount of carbon and nitrogen obtained by them was 33,537 grains and 1,316 grains per computed adult weekly.

Bread stuffs.

In no family was bread bought in quantities to supply the wants of the family, but only in small quantities, to supplement that which they had baked. Hence the purchasing of flour and the making of bread at home were universal. The flour employed was nearly always white, and of the quality known as seconds. Oatmeal was eaten in ¾ of the

cases, but only in quantity sufficient to make gruel. Peas and rice were more generally purchased, but the quantity never exceeded 2 lbs., and in nearly half of such cases it was less than 1 lb. per week. The rice was used only to make puddings, and the peas to make soup. The total average quantity of bread stuffs reckoned as bread was 11·9 lbs. per adult weekly.

A majority of the persons referred to had small gardens or plots of potato ground in "cottage gardens," and hence the use of fresh vegetables was universal. The average quantity of potatoes then in use was 4 lbs. per week for each adult, or 20 lbs. weekly for each family.

IN-DOOR OCCUPATIONS.

STOCKING AND GLOVE WEAVERS.

Sugars were eaten largely, and both treacle and sugar were consumed by every family. The average quantity was 3 lbs. 6 oz. per family and 11 oz. per adult weekly.

Fresh vegetables.

Butter was procured by every family in weekly quantities varying from $\frac{1}{2}$ lb. to $3\frac{1}{2}$ lbs. Lard or dripping was consumed by $\frac{9}{21}$, and suet by $\frac{15}{21}$ families. The total average quantity of fats eaten was $18\frac{3}{4}$ oz. per family and $3\frac{1}{2}$ oz. per adult daily.

Sugars.

Fats.

Meats.

Butchers' meat or bacon was procured in every case, and in only $\frac{4}{21}$ families were there not both. The quantity of bacon varied from $\frac{1}{2}$ lb. to 4 lbs., and of butchers' meat from $\frac{1}{2}$ lb. to 6 lbs. per family weekly, but of the two together only one family ate less than $2\frac{1}{2}$ lbs. weekly. Many families purchased bacon and butchers' meat in alternate weeks. The total average was nearly $3\frac{3}{4}$ lbs. per family and $\frac{3}{4}$ lbs. per adult weekly.

Fish.

Fish, including herrings, was most rarely eaten.

Milk.

Skimmed milk and buttermilk were never purchased, and whey was procured by only one family. New milk, however, was invariably eaten in quantities averaging from 1 pint to 21 pints weekly, and in a total average of upwards of 6 pints for each family and $1\frac{1}{4}$ pints for each adult weekly.

Cheese.

Cheese was used in every family except one, at the rate of $\frac{3}{4}$ lbs. per week.

Eggs.

Eggs were procured in more than half of the cases, and in many instances from their own fowls.

Tea.

Coffee.

The use of tea was universal, in quantities varying from $1\frac{1}{2}$ oz. to $4\frac{1}{2}$ oz. per family weekly, and coffee was consumed in small quantities by half of the families. The total average consumption of tea was nearly 2 oz. weekly per family.

Beer.

Beer of the ordinary strength was drank by only three families, but at Ilkeston every family obtained a weak beer, costing 2*d.* per gallon. Ginger beer and herb beer were made in many families. Cider was not used.

Cost of food, and its relation to quantity of nutriment.

The cost of the food thus obtained was 12*s.* 6*d.* per family and 2*s.* $6\frac{1}{4}$*d.* per adult on the average, and the quantity of carbon and nitrogen obtained for each 1*s.* thus spent was 13,296 grains and 522 grains.

Meals.

Four meals per day were usually eaten, and the following was the composition of them in two families. (No. 92.) Horsley Woodhouse. *Breakfast*:—Milk and oatmeal for the children, coffee, bread, and sometimes bacon for the adults. *Dinner*:—Always hot, and with meat or bacon, and vegetables and bread, daily. *Tea*:—Tea, bread, and butter, or treacle. *Supper*:—Milk. (No. 100.) Ilkeston. *Breakfast*:—Coffee, bread, and butter. *Dinner*:—Hot meat, with vegetables daily, and pudding about four days per week. *Tea*:—Tea, bread, and butter. *Supper*:—Bread and cheese or bacon. There are also many families who did not have hot dinners more frequently than three times a week. Domestic cookery and general management were commonly very defective. The worst case which I met with was No. 102.

Ilkeston, where, with an income of 15*s.* per week, there was scarcely any furniture in the room, and the children ate fried bacon and new potatoes out of the dish with their fingers.

Nos. 6, 7. *Conditions of Nourishment.*

The following conclusions seem warranted by the foregoing facts:

6. Food of lowest-fed classes, by Dr. E. Smith.

1. The nourishment obtained is good of its kind, and varied.
2. The cost is moderate.
3. The quantity is almost exactly that recommended by me for the Lancashire operatives; viz., 30,100 grains of carbon and 1,400 grains of nitrogen weekly, whilst its cost is somewhat higher.

IN-DOOR OCCUPATIONS.

4. They are moderately fed, but do not exhibit a high state of health.

STOCKING AND GLOVE WEAVERS.

5. The general conditions in which they are placed are not unusually unfavourable to health.

Conclusions.

6. Case No. 8. may be regarded as a typical family with many children.

Shoemakers.

SHOEMAKERS. Preliminary questions.

This class of persons are found congregated together in certain districts, as at Stafford and Northampton, where they make shoes which supply other parts of the country, and the army and navy, and there are also others scattered in every town and village, making and repairing the shoes of the residents only.

The former class was the most accessible to me, and offered conditions special to the class which could not have been found in those living in the latter situations. I found that the workmen were divided into three classes, 1st, 2nd, and 3rd class, according to the quality of the shoes which they made. Hence the class indicated the skill of the workman, and although an expeditious workman could make a greater number of low than of high class goods, the differences in the prices of the classes prevented the inferior from obtaining the income of the superior, if both were equally industrious workmen. Hence, other things being equal, the lower class was the worst paid workman.

A 1st-class workman can obtain from 1*l.* to 2*l.*, a 2nd class 18*s.*, and 3rd class 12*s.* per week, and as lads were enabled to work at the 3rd class, the 3rd class shoemaker may add to his own earnings by their help. A moderate workman can make eight pairs of blucher boots per week, at a return of 1*s.* 3*d.* per pair, out of which sum he has to purchase hemp, knives, and other articles termed "grindery." Six or seven pairs of clarence boots at 2*s.* 1*d.* per pair is also a fair week's work. The fact that a pair of boots can be made daily has led to the habit of receiving payment for the work daily, and of buying the articles of food in small quantities every day.

I therefore excluded from my enquiries the 1st-class workman, and selected the 3d class, sometimes, however, admitting the 2nd class, according to the amount which he could earn per week.

The general habits of these persons are not good, so that much of the income is wasted. The houses are not clean and well managed, and the whole of the families look pale, somewhat weak, and dirty. There is also much diversity in the amount of work which they can obtain, and perhaps as much in that which they are *disposed to do*.

Number of enquiries.

The number of families included in the enquiry was 21, of persons 114, and of computed adults 88½.

Means of families.

The average income of the husband in the cases enquired into was 13*s.* 3*d.* per week, and this often included some help from the other members of the family. I found it very difficult to obtain an estimate of the average income from the labour of the wife and children, since it

Nos. 6, 7. *Conditions of Nourishment.*

was ill paid for and uncertain in quantity; but in nine families where some increase was generally obtained from this source the average total income was 19*s.* 10*d.* per week.

6. Food of lowest-fed classes, by Dr. E. Smith.

The total average amount of nutriment obtained was 31,700 grains of carbon and 1,332 grains of nitrogen per adult weekly.

IN-DOOR OCCUPATIONS.

Bread was purchased in $\frac{4}{5}$ of the cases; but in $\frac{1}{5}$ of them it only supplemented the bread baked at home. In one half of the cases white seconds flour was purchased, and made into bread at home, whilst in every case, except one, some flour was used for puddings or hot cakes. Oatmeal was purchased in only three, peas in six, and rice in eight families, and always in very small quantities. Rice was never used without milk. The total average consumption of bread stuffs was 42·6 lbs. per family, and 11·24 lbs. per adult weekly.

SHOEMAKERS.

Nutriment obtained.

Bread stuffs.

Fresh vegetables.

Potatoes and green vegetables were almost universally used; the former in every family, and in quantities of about 15 lbs. per family, and $3\frac{1}{2}$ lbs. per adult weekly; the latter in one half of the families. The green vegetables were always, and the potatoes usually, purchased for the Saturday's supper and Sunday's dinner.

Sugars.

Sugars were eaten largely and universally. The average quantity was 41 oz. per family and 10 oz. per adult weekly. Treacle was eaten by $\frac{4}{5}$ of the families. It was the custom both in Northampton and at Stafford, but particularly at the latter place, for a family to buy half a pound of sugar every day.

Fats.

The separated fats included each of the kinds recorded in the majority of cases, and averaged 24 oz. per family and $5\frac{3}{4}$ oz. per adult weekly. Butter was purchased by every family, except one, and was usually bought every day. Suet was obtained with the meat on Saturday for the Sunday's pudding.

Meats.

The total average consumption of meat and bacon was 70 oz. per family and $15\frac{3}{4}$ oz. per adult weekly. In some instances it was bought in small portions every day, but in others it was obtained only once in the month. Bacon alone was eaten by only one family, but with other ment it was eaten by two thirds. The English and costly bacon was generally preferred, on the ground that the fat did not run out when the bacon was boiled, and hence was cheaper than the American bacon at half the price. It was also usually purchased in portions of a $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb. daily.

Milk.

New milk, which was very poor in both Stafford and Northampton, was obtained by $\frac{4}{5}$ of the families. Skimmed milk was purchased by two families at Stafford, but they did not use buttermilk or whey. The average consumption per family was 77 oz. and per adult 18 oz. weekly.

Cheese.

Cheese was eaten rather largely by these populations, and particularly at Stafford. It was usually eaten for supper, and many families in both towns bought one pennyworth each night. The average amount consumed was about 14 oz. per family weekly.

Eggs.

Eggs were obtained by about half of the families, and several of them kept fowls. One family at Stafford ate 14 eggs per week.

Tea.
Coffee.

Tea was universally and largely drank, whilst coffee was purchased by only $\frac{3}{71}$ of the families. Tea was commonly bought in quantities of $\frac{1}{2}$ oz. daily, and the total average was $3\frac{1}{4}$ oz. per family or $\frac{3}{4}$ oz. per adult weekly.

Beer.

Beer, both of the ordinary and inferior strength, was generally consumed, the former quality by half and the latter by two-thirds of the people. The average quantity consumed by those who drank it was three pints of ordinary and five pints of weak beer weekly. The general plan was to purchase half a pint or a pint of beer each night

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for supper. It is, however, probable, from the reputed habits of this class, that beer was drank by them out of their own houses, and in addition to that now stated.

The average cost of food was 2*s.* 7¾*d.* per adult weekly, and for each 1*s.* thus expended 12,000 grains of carbon and 504 grains of nitrogen were obtained.

Four meals daily were usually eaten, and the food supplied at each is thus described by several families :

Stafford.—*Breakfast*, 8 a.m. :—Tea, bread, and butter, with milk added to the tea for the children. *Dinner*, 12 :—Meat, Sunday and Monday with vegetables, and other days, bacon and bread. *Tea* 4 p.m. Same as breakfast. *Supper* 8 p.m. :—Bread, cheese, and beer for the parents, milk and bread for the children.

Breakfast, 8 a.m. :—Bread, or bread and butter, or bread and bacon. *Dinner*, 12 :—Husband had no dinner. Wife and children, bacon or meat 3 days per week, and bread alone or bread and dripping the other days. Pudding on Sunday. *Tea*, 5 p.m. :—Bread, butter, or dripping. *Supper* 9 p.m. :—Bread, cheese, and beer.

Cost of food, and relation to nutriment obtained. Meals.

Northampton, *Case* No. 106.—*Breakfast :*—Tea or coffee, bread, butter, or treacle. *Dinner :*—Meat pudding with suet crust and potatoes, or fried meat and bread. *Tea*, same as breakfast. *Supper :*—Bread, cheese, and 1 quart of beer.

Case No. 109. *Breakfast :*—Tea, bread, and butter. *Dinner :*—Meat, potatoes, and bread, 5 days weekly. *Tea* as breakfast. *Supper :*—Bread, cheese, and beer.

Case No. 110. Single woman. *Breakfast and Tea :*—Tea, bread and butter. *Dinner :*—Meat and vegetables ; pudding on Sundays. *Supper :*—Meat, or bread and butter.

Conclusions.

The general conclusions may be stated as follows :—

1. Shoemakers are not a thrifty and well-conducted class.
2. The posture of the body in which they must pursue their occupation, with the many hours during which they labour daily, tend greatly to induce ill health, and perhaps lead to a desire for stimulants and late suppers.
3. The general health of the members of the families is not good.
4. The wife and children cannot obtain an adequate return for their labour, so that the support of the family almost entirely depends upon the husband.
5. They obtain a moderate amount and variety of food.
6. The expenditure of money on food is only moderately economical.

GENERAL COMPARISON OF IN-DOOR OCCUPATIONS.

GENERAL COMPARISON of the DIETARY in the IN-DOOR OCCUPATIONS.

Having thus stated the leading features in the dietary of the different occupations referred to, it will be convenient to give in a short summary a comparison of the whole.

Carbon and nitrogen.

The amount of carbon obtained by each adult weekly varied from 22,900 grains in the needle women of London to 33,537 grains in the stocking makers of Derbyshire, whilst that of nitrogen varied from 950 grains in the needle-women to 1,332 grains in the shoemakers of Northampton and Stafford. The average in these in-door occupations was 28,876 grains of carbon and 1,192 grains of nitrogen. When the free hydrogen in the dietary is calculated and reckoned as carbon, the total average amounts is 2,000 grains per adult daily, and if this be added to the actual carbon, the total will be 30,876 grains. When compared with the amount of nutriment obtained by the Lancashire operatives in December 1862 when out of employment, it shows an excess in favour

of the latter of 335 grains of carbon and 102 grains of nitrogen weekly, and when contrasted with the quantity of nutriment which I deemed to be necessary for the Lancashire populations (including an equal number of men and women) shows a deficiency of 138 grains of nitrogen. Thus—

TABLE No. 1.

Mixed Sexes.	Average weekly Carbon.	Average weekly Nitrogen.
	Grains.	Grains.
Five in-door occupations - -	28,876	1,192
Unemployed Lancashire operatives -	29,211	1,295
Minimum quantity to be allowed to the Lancashire operatives, equal number of males and females - - - -	28,600	1,330

Bread stuffs. The quantity of bread stuffs consumed varied from 7¾ lbs. in the needle-women to 11½ lbs. in the shoemakers, and yielded a total average of 9·9 lbs. per adult weekly.

Potatoes. The weekly amount of potatoes eaten by the different classes varied only from 2 lbs. to 5¼ lbs. per adult, the former occurring in the silk weavers, and the latter in the kid glovers; but it must not be forgotten that the quantity of potatoes consumed varied with the season of the year, and as these enquiries at the different places were made at different seasons, the results in this particular cannot be satisfactorily compared with each other.

Sugars. The use of separated sugars was almost universal, there being only four exceptions, and three of them were amongst the kid glovers. Treacle was used generally in the country (except amongst the kid glovers), and but rarely in town. The average quantity of sugars consumed varied from four ounces by the kid glovers to 11 ounces by the stocking makers per adult weekly, and was on the total average of the whole eight ounces. The needle-women and stocking makers were the largest and the kid glovers the smallest consumers of sugars.

Fats. Some kind of separated fat was consumed by every case but two, and of all the kinds butter was by far the most commonly used. The average quantity varied per adult weekly from three and a half ounces by the stocking weavers to seven ounces by the kid glovers, a relation the opposite to that of sugar, and the total average quantity was five ounces per adult weekly.

Meats. Meat was obtained by all the cases except five, and those were exclusively met with amongst silk weavers at Macclesfield and Coventry. Butchers' meat was, however, not eaten at all, or at intervals too distant to bear computation, by 20 per cent. of the cases, nearly all of whom were silk weavers and kid glovers; but, with the exception of the five cases just referred to, the consumer might have purchased butchers' meat instead of bacon had he so desired. The average quantity of meat and bacon consumed per adult weekly varied from seven and a quarter ounces by the silk weavers to 18¼ ounces by the kid glovers, and the total average was 13·6 ounces.

Milk. Milk was purchased by 72 per cent. of the families, and the average quantity varied from seven fluid ounces in the needle-women to 24⅜ fluid ounces in the stocking makers. The greater portion of those who did not obtain milk were needle-women in London, whilst stocking makers in Derbyshire, silk weavers in Cheshire, and shoemakers in Staffordshire obtained it the most abundantly. Skimmed milk was used

largely at Macclesfield and Coventry. The total average quantity of milk consumed was eighteen ounces per adult weekly. Cheese was eaten chiefly by the shoemakers, stocking makers, and kid glovers.

Tea was consumed universally, there being only three exceptions; but coffee was drunk by only half of the families ($\frac{69}{125}$). The average quantity of tea varied per family weekly from $1\frac{3}{4}$ oz. by the kid glovers to $3\frac{1}{4}$ oz. by the shoemakers, and per adult from $\frac{3}{5}$ oz. by the silk and stocking weavers to $1\frac{1}{4}$ oz. by the needle-women. The shoemakers and Spitalfields weavers, however, although purchasing tea at the rate of $3\frac{1}{4}$ oz. per family, did not consume more than $\frac{3}{4}$ oz. per adult weekly. Tea and coffee.

Beer of the ordinary strength was drunk very generally by the silk weavers of London, and by the shoemakers, and of a very poor quality by the stocking makers of parts of Derbyshire. It was not drunk at all by $\frac{1}{2}$ ($\frac{69}{125}$) of the families. Beer.

The average cost of food per adult varied from 2*s.* $2\frac{1}{2}$*d.* amongst the silk weavers (1*s.* $8\frac{1}{2}$*d.* only at Macclesfield) to 2*s.* $9\frac{1}{2}$*d.* amongst the kid glovers weekly. Cost of food and relation to nutriment obtained.

The amount of carbon which was procured for each 1*s.* varied from 8,869 grains amongst the needle women of London to 13,296 grains by the stocking weavers of Derbyshire (16,008 grains by the silk weavers at Macclesfield), and gave a total average of 11,431 grains. That of nitrogen varied from 336 grains by the needle women of London to 522 grains by the stocking makers of Derbyshire (600 grains by the silk weavers at Macclesfield), and was on the whole 454 grains.

Some of the above-mentioned facts are compressed into the following table, showing certain averages per adult weekly:

TABLE 2.

	Carbon.		Nitrogen.		Value of Food.	Bread.	Sugar.	Fat.	Meat.	Milk.	Tea.
	Total.	For 1*s.*	Total.	For 1*s.*							
	grains	grains	grains	grains	*s. d.*	lbs.	oz.	oz.	oz.	fl. oz.	oz.
Silk Weavers -	27,620	12,769	1,151	476	2 2¾	9½	7½	4½	7¼	22	⅔
Needle-women -	22,900	8,869	950	336	2 7	7½	7½	4½	15	7	⅔
Kid Glovers - -	28,023	10,231	1,213	434	2 9¼	8¼	4¼	7	18¼	18¼	·9
Shoemakers - -	31,700	12,000	1,332	504	2 7¼	11½	10	5¼	15½	18	⅘
Stocking Weavers -	33,537	13,296	1,316	522	2 6¼	11·9	11	3½	11½	24½	⅗

The conclusions at which we arrive from this investigation are as follows:— General Conclusions.

1st. No class under enquiry exhibited a high degree of health.

2nd. The least healthy classes were the kid glovers, needle-women, and Spitalfields weavers.

3rd. The average quantity of food supplied was too little for health and strength.

4th. The worst fed classes were the needle-women, silk-weavers, and kid glovers.

5th. As a class they did not spend their money upon food economically.

6th. The instances of Macclesfield weavers and of London needle-women show in remarkable contrast the effect of economical and wasteful expenditure of money on food.

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

2. OUT-OF-DOOR OCCUPATIONS.

Farm Labourers.

Extent of the enquiries.

As this is the largest class of the community, and one living in almost every part of the United Kingdom, I have thought it necessary to make the enquiries over the widest area, and to obtain information under every known condition. The time allotted to the enquiry limited its extent, so that only a hasty visit could be made to any locality; but by suitable pre-arrangements, and the aid of medical and other friends, I have been able to visit the different counties of England, the greater part of North and South Wales, with the Isle of Anglesea, the south and west of Ireland, and the western highlands, with some part of the southern lowlands of Scotland, and to take a few cases in every locality. The extent of the enquiry is therefore sufficient in a national point of view, and cannot fail to yield results which will approach very nearly to a correct average of the dietary of the whole of these populations. It does not, however, pretend to be sufficient to give the nearest approximation to truth in reference to any smaller area, as, for example, each of the different counties in England, or the whole of either of the sister kingdoms, since for so minute a purpose it would be requisite to make enquiries over the greater portion of each county or kingdom, and to take numerous cases in each locality. But most interesting as it would be to gentlemen resident in each part of the kingdom to learn in the most precise manner the dietary of their locality, it did not seem to be necessary, in a wider and national point of view, to do more than to take examples over the whole area, and indeed the limitation of time only permitted that course to be adopted which seemed likely to give results very closely approximating to the truth.

Arrangement of the results obtained.

The results thus obtained may be conveniently arranged under four heads, as they have been derived from enquiries prosecuted in the four large divisions of the United Kingdom, and I purpose to consider them in reference to England, Wales, Scotland and Ireland, separately and in their order. The enquiries in Wales have been separated from those of England (although it is now usual to speak of England and Wales together), because of the differences of habits and food which occur in those two divisions of the kingdom, and which, if added together, would have vitiated the general average, so far as relates to England. No inconvenience seems likely to flow from this plan; but the tables are so arranged that the two may be considered together by any who prefer that course.

ENGLAND.

1. ENGLAND.

Preliminary observations.

Besides the general idea of including every county of England in the enquiry, I have especially desired to make enquiries where the dietary was believed to be relatively very low or very high; as, for example, in Wilts, Dorset, and Somerset on the one hand, and Yorkshire on the other, as also wherever there were known to be peculiarities in the dietary, as the cider counties of Devon and Worcester, and the oatmeal, barley, and maslin districts of the north of England, and have endeavoured to carry out the enquiry in a more extended manner in those several localities. As the enquiry progressed it was found that such peculiarities extended more widely than were commonly reported; as, for example, poor living in Berks, Bucks, Norfolk, and Staffordshire, and regret was felt that in all these places the present enquiry could not be extended.

Grouping of the counties.

The returns have been placed under the heads of the counties to which they refer, but there has not been any attempt to group the

counties together, otherwise than by their proximity to each other. The arrangement made by the Registrar General in the groupings of counties is no doubt a favourable one for the purpose of this report, and the two will have a substantial agreement, but as the artificial division of the country into counties is but imperfect evidence of a similar arrangement with regard to food, it was feared that the grouping of counties together into divisions would introduce further error, by classing together conditions which might not be similar, and hence would be of value only so far as related to the counties of which each group was composed, and which could be separately referred to in this report.

I do not purpose to enter into any general statement of the conditions under which the labourers in England live, since the subject is too extensive for the present purpose, but will simply offer two observations.

I have endeavoured to ascertain the usual wages of the labourers throughout the country, and also the income derivable from the labour of the wife and children. In the former I have succeeded so far as regards the weekly payments in money, and a statement of the allowances, if any; but the true monetary value of the allowances I have not been able to estimate with accuracy, and cannot therefore compare with absolute truthfulness the wages in different parts of the country. When the children were regularly engaged, and received weekly wages, I have also obtained the information, but when the wife only obtained work in harvest time, and at a few periods of the year, I formed the nearest approach to a correct average which was possible. But whilst unable to state the income very accurately, the tables will show that the total income of the family is often very much greater than the wages of the husband, and that the latter can never be permitted to represent the former. Thus in Wiltshire I found two families each obtaining 26*s.* a week, whilst the wages of the husband were only 9*s.*; and such was common in every county.

Wages.

The value of the allowance must always be considered, and added to the wages, when an attempt is made to estimate the income of the labourer. Thus in Cornwall, Case No. 131 received wheat, straw, faggots, turnips, and cider; Case No. 133 had monthly 1 bushel of barley and ¼ a bushel of wheat, potato land, and cider. In Devon, Case 134 had wheat, barley, and cider; Case 157., potato ground, house rent, straw, and milk. Somerset, Case 170., wheat and house rent. In Dorset the labourers had wheat; in Wilts, potato ground. In Salop, half the crop of potatoes from ground planted by himself. In Lincoln, potato ground and weak beer. In Cheshire, Case 275 had milk, butter milk, and whey. In Northumberland, Case 283 had house rent, 40 stones of potatoes, 20 stones of barley, and 4 pecks of wheat, yearly; whilst others had 80 stones of potatoes, and 8 pecks of wheat, or 20 stones of potatoes, and 1*l.* a year for coals, with higher wages, and in all these cases the rent was free. Beer was allowed in Staffordshire, Essex, Hants, Rutland, and other counties. In some counties the labourers were not allowed to keep a pig, as in Hants and Rutland, lest they should steal from their employers the food wherewith to feed it; but usually this restriction did not exist. In the southern counties it was usual to charge a low price for the wheat and barley; but this varied.

Allowances

In Dorsetshire, where the nominal wages are 8*s.* a week in money, there are also free rent of house and garden, fuel cut and carried, a chain of potato ground prepared and manured, and a bushel of wheat (worth 5*s.*) monthly. These are estimated at about 4*s.* per week; 1*s.* is also given when sent on a long journey. In summer time 20*s.* extra are allowed for harvest work. One gallon of cider per day at 4*d.* per gallon for six months for the labourer, three pints of cider per day during six months

APPENDIX.

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

for the wife, and one quart of cider for each working boy during the same period are given. This estimate is derived from Sir John Smith's property near to Maiden Newton, and clearly shows that the wages in money do not represent two thirds of the whole income, but it must be added that these advantages are not universal.

The income of the family is also largely made up from wages derived from other sources of industry than agriculture, and I will name a few of those which have come under my notice in connection with the cases to be now recorded.

OUT-OF-DOOR OCCUPATIONS.

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Straw-work (plaiting and sewing) occurred in Beds, Bucks, Essex, Herts, Oxford, &c. Lace-work in Bucks, Beds, Notts. Gloving in Somerset, Wilts, Dorset, Devon, &c. Mining and metal-work in Gloucestershire, Derbyshire, Notts, Salop, Northampton, Northumberland, Cumberland, Yorkshire, &c. Mill-work and various kinds of weaving in Derbyshire, Notts, and Yorkshire. Dockyards in Devon. Railway labour and brick making in many counties. Needle making in Worcestershire. Blanket manufacture in Oxfordshire. Knitting baby's boots in Rutland, &c. And various kinds of employment in the neighbourhood of large towns.

Other labour than agriculture.

Labourers do not hold land.

The cases were very few in which the labourer held any land beyond that of a cottage garden, but in Yorkshire I found some who held from 2 to 10 acres, and kept one or more cows. Such were not regarded as purely farm labourers.

Number of inquiries.

The cases included in this part of the enquiry are numbered from 126 to 502, and are recorded in the tables placed in the Appendix.

They comprehend 370 families, 2129½ members, then taking food at home, and 1685½ computed adults.

Carbon and nitrogen.

The total average amount of carbon and nitrogen contained in the food was 40,673 grains and 1,594 grains per adult weekly, a quantity much greater than that obtained by the in-door labourers already referred to, and than the amount judged to be necessary for the Lancashire operatives. When the free hydrogen in the food is calculated and reckoned as carbon the amount is 2,600 grains, and if this be added to the actual carbon the total is 43,273 grains.

Variation in counties—

of carbon;

There was much variation in the amount of these elements of nutrition in the different counties, but less probably than has been generally believed. In reference to carbon, the largest quantity consumed in any county on the average per adult was 48,648 grains weekly, and the following 14 counties were above the average of the whole, viz., Cumberland, Northumberland, Warwick, Suffolk, Durham, Nottingham, Salop, Worcester, Westmoreland, Kent, Gloucester, Lancaster, Sussex, and Cambridge, in their order. There was no county in which the quantity consumed was so little as 31,000 grains, and in three only, viz., Somerset, Wilts, and Norfolk, was it below 35,000 grains per adult weekly. Hence in more than half of the counties the quantity of carbon obtained by each adult weekly was between 35,000 and 40,000 grains.

of nitrogen.

There was a greater proportional variation in the amount of nitrogen consumed, and the relation to the average was not always (although generally) in the same counties as has been shown in reference to the carbon. In one county the weekly quantity per adult exceeded 2,000 grains, and in 15 counties the average quantity exceeded the total average and was 1,600 grains. These, in their order, were Northumberland Cumberland, Westmoreland, Durham, Salop, Worcester, Gloucester, Suffolk, Warwick, Lancaster, Sussex, Surrey, Notts, Lincoln, and Leicester.

In so many as 10 counties it was below the standard for Lancashire operatives, viz., 1,400 grains weekly. In Berks, it was a little below 1,200; in Rutland, Oxford, Hants, Stafford, and Somerset, it was below 1,300; and in Cornwall, Wilts, Cheshire, and Essex it was below 1,400 grains weekly.

6. Food of lowest-fed classes, by Dr. R. Smith.

The relation of the nitrogen to the carbon was very low in these counties, as it was indeed in the average of all England. Thus if bread be taken as the type of food the proportion of nitrogen to carbon is nearly as 1 to 22; and if milk be taken, the proportion is about doubled; but on the total average of the agricultural labouring populations of England it was only as 1 to 25, and in Berks, the lowest county in relation to nitrogen, it was as 1 to 31, and in the 10 counties, in all of which the quantity of nitrogen obtained was much below the average of the whole, it was on the average as 1 to 27. Even in some of the northern counties, as in Northumberland, in which the largest quantity of both carbon and nitrogen was consumed, it was as only 1 to 24.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

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Relation of nitrogen to carbon; importance of.

The importance of this relation is, however, restricted to the cases in which the total quantity of nitrogen is below that supposed to be required by the body; on the ground described in my report on the Lancashire operatives, viz., that it is an important aid in the digestion or assimilation of the carbonaceous foods. If the quantity of carbon supplied be not much in excess of the requirement, whilst that of nitrogen is deficient, the effect upon the nutrition of the body will be far more disastrous than can occur when the total quantity of both is sufficient, although the relation to each other may be less. In the former case there will be deficient nutrition, whilst in the latter there will simply be waste of carbonaceous food. Hence the importance of the deficiency in the supply of nitrogen in the 10 counties just mentioned is as great absolutely as in its relation to the quantity of carbon.

Deficient supply in individual cases of carbon.

As any deficiency in nutriment in a given case cannot be compensated by excess in others, it is important to determine what proportion of the individual cases suffered defect, and as a standard of comparison I will take that proposed for the Lancashire male operatives, viz., 30,100 grains of carbon and 1400 grains of nitrogen per adult weekly.

Families receiving nutriment below this standard were met with in nearly every county, but the proportion was very much greater in those which gave a low total average. Thus 77 families, or about 21 per cent. of the whole, obtained less than the standard quantity of carbon, and of these 11 families, or 3 per cent., ate less than 25,000 grains, and 1 family less than 20,000 grains per adult weekly. The last occurred in Devon, and of the former 2 were found each in Devon, Somerset, Wilts, and Stafford, and 1 each in Dorset, Norfolk, and Essex. The following are the number *per cent.* of such cases in the different counties where more than 1 such case occurred:—

Per cent. in counties.

Devon 35, Somerset 43, Dorset 21, Wilts 48, Derby 22, Stafford 22, Northampton 20, Norfolk 28, Oxford 27, Berks 80, Herts 26, Beds, 33, Rutland 25, and Yorkshire 16 per cent.

Deficient supply of nitrogen.

The families were much more numerous who received less than the standard quantity of nitrogen, and the defect was in many cases proportionally greater. The frequency with which the defect occurred was 36 per cent., more than one third of which number of families lived in Cornwall, Devon, Somerset, Wilts, and Dorsetshire only. The following is the per-centage in the different counties having more than one in each family in the cases under enquiry, viz.—

Per cent. in counties.

Cornwall 57, Devon 41, Somerset 56, Dorset 26, Wilts 53, Worcester 28, Notts. 28, Leicester 22, Cheshire 60, Derby 33, Durham 50, Stafford 44, Warwickshire 25, Northampton 40, Norfolk 57, Essex 33,

Least supply.

Sussex 22, Hants 66, Oxford 72, Berks 80, Bucks 42, Herts 53, Cambridgeshire 21, Beds 33, Rutland 62, and Yorkshire 29 per cent. Hence in almost every part of England, and surrounded by persons of their own class having abundant nourishment, there were families obtaining a deficiency of nitrogen. But, further, there were 39 families, or 12 per cent., who received less than 1200 grains, 6 families, or 2 per cent., who received less than 1000, and even 8 families, or 2 per cent., who obtained less than 900 grains per adult weekly. The least quantity was 718 grains, and occurred in Stafford, and also 757 grains in Somerset, whilst the other varied from 823 grains in Berks to 861 grains in Devon, 863 grains in Oxfordshire, and 890 grains in Rutland. The cases having between 1000 and 1200 grains only were numerous in Devon, Somerset, and Wilts, and constituted 14, 26, and 23 per cent. of all the cases enquired into there; and besides these they were found in Cornwall, Dorset, Worcestershire, Notts, Derbyshire, Durham, Stafford, Warwickshire, Norfolk, Essex, Hants, Oxfordshire, Berks, Herts, Hunts, Cambridgeshire, Beds, Rutland, and Yorkshire.

Value of per-centage relation.

In estimating the value of these numbers it will not be right to attach too great importance to the precise per-centage in each county, since the number of enquiries made were too few to give a fair average of the whole in each county; but, without entering too minutely into this part of the question, it may be fairly inferred that Cornwall, Devon, Somerset, Dorset, Wilts, Stafford, Oxford, Berks, and Herts have an unenviable pre-eminence, and it is much to be desired that an extension of the enquiry should be made in those counties.

Very large supply in individual cases.

It is not so important to point out the individual families in which very large quantities of nutriment were consumed, since they only show how much waste of food occurs, and from their infrequency cannot prove that so large an amount is necessary for the body. Hence I will only give the numbers of the most striking instances.

Of carbon.

In reference to carbon, two instances occurred in Worcestershire and Cumberland where the quantity consumed was upwards of 70,000 grains per adult weekly. Mr. Thompson, a large farmer, and most intelligent gentleman, in Yorkshire, stated to me the quantity of food consumed by labouring men living in his house, and it contained per adult weekly the enormous quantity of 81,000 grains. Six families ate more than 60,000 grains, and 32 families, or nearly 9 per cent., more than 50,000 grains per adult weekly. These instances were widely distributed in both the ill-fed and well-fed counties; viz., in Devon, Wilts, Gloucester, Worcester, Notts, Derby, Northumberland, Durham, Cumberland, Lancashire, Warwickshire, Northamptonshire, Norfolk, Suffolk, Kent, Sussex, Surrey, Bucks, Herts, Hunts, Cambridgeshire, Rutland, and York, but omitting Cornwall, Somerset, Dorset, Cheshire, Westmoreland, Stafford, Essex, Hants, Oxford, Berks, and Beds.

Labourers living at farmhouses.

In families.

Wide distribution of.

Of nitrogen.

At farmhouses.

In families.

In reference to nitrogen it may be first stated, that the young men living with Mr. Thompson just mentioned ate 3,900 grains each weekly. Of families living at home, 11 per cent. ate more than 1,800 grains, 9 per cent. more than 2,000 grains, and 8 cases, or 2 per cent., obtained more than 2,500 grains per adult weekly. The largest amount was 2,950 grains; but four cases in Devon, Worcestershire, Cheshire, Cumberland, and Warwickshire had each more than 2,900 grains. On the whole no less than 22 per cent. of the families included in the enquiry obtained more than 1,800 grains of nitrogen per adult weekly.

Large quantities of both in the same cases.

There was commonly a connexion between the very large amount of both carbon and nitrogen, since both were found in the same case, but it was not so in quantities less than the extreme. It is also worthy of note how widely these cases were distributed over the country, and

that even in the poor districts of Devon, Dorset, and Wilts they were 17, 42, and 32 per cent. of the whole. The only counties in which these large quantities did not occur were Cornwall, Hants, Oxfordshire, Berks, and Beds.

I do not purpose to offer any explanation of the causes of the defective or excessive amount of food which is obtained by a portion of the farm labourers in every locality, except to state that as a rule those who have defective food have large and those with excessive food smaller families than others in the same locality. On the total average of the cases there were $5\frac{3}{4}$ members in each family, whilst 136 families, obtaining less than 1,400 grains of nitrogen daily, had as the average $6\frac{1}{2}$ members. Eight of them had 10 or more members in each family. The age of the children in reference to their ability to work has also a most important bearing upon this question, since under 10 years they rarely have wages, whilst a family having several boys aged 10 years and upwards is in a prosperous condition.

Counties where large quantities did not occur.

I shall now proceed to state the quantity of each kind of food which is obtained, and the number of families who obtain it.

Causes of variation in the amount of nutriment.

Bread ready baked was purchased as a principal member of this class of foods by 30 per cent. of the whole cases, and as an adjunct to other members of the class by 50 per cent.

BREAD STUFFS.

Bread, where generally purchased. Causes of.

In only three counties, Surrey, Hants, and Bucks, was it bought as a principal farinaceous food by every family included in the enquiry, but in the following counties it was very generally purchased, viz., Somerset, Northampton, Oxfordshire, Berks, Beds, and Rutland. It was also used by a portion of the families as the principal bread stuff in Cornwall, Devon, Dorset, Wilts, Lincolnshire, Notts, Leicestershire, Derbyshire, Staffordshire, Warwickshire, Essex, Herts, and Hunts. The counties in which it was generally purchased, and in which the baking of bread was not effected at home, included those where the dietary was the poorest, as the five south-western and some of the south-midland, the eastern and south-eastern counties. The habit of purchasing bread instead of baking it at home may be in part due to the expense of coal in some of the counties referred to, and in other part to the deficiency of convenience for baking; but it is too generally associated with an ill-managing wife, and leads to the feeding of the children with dry bread, or bread with a very little fat placed upon it, as an easier mode than cooking a dinner.

Wheaten flour in general use.

Wheaten flour was purchased as a principal member of this class by 60 per cent. and as a part of the dietary by 90 per cent. of the whole.

Quality of.

The quality was almost universally that known as seconds. In only one case, and that in Wilts (Case 221), was whole brown meal ordinarily used. The white flour is preferred, because it may be eaten with little or without any butter more readily than brown bread and hence is cheaper, Case (No. 485). The brown bread purges the children particularly, and hence must either be discontinued, or induce debility, as was remarked by Case 485, whilst it is employed by Mr. Thompson in Yorkshire to carry off the excess of food which his men eat (page 23). It is also to be added, that the cost of seconds flour is now scarcely greater than that of brown flour of equal quality. I am convinced, from extended enquiry amongst this class, that the universal adoption of white flour at the present day is based upon principles of sound economy, both as regards the cost of food and the nutriment which the young and old members of a family can derive from it. It is not, as some persons still assert, a prejudice either in reference to the use of the one kind or the avoidance of the other.

Brown meal not so economical as white flour.

Wheat allowed at a low price. Is ground for the labourer.

It is a custom in many counties for the labourer to have wheat allowed him as a part of his wages, as in Northumberland, or sold to him by the farmers below its market value, as in Cornwall (Cases 131 and 133), Devon (Case 134), and Somerset (Case 170), in each of which cases the quantity allowed is limited, and insufficient for the family. In many localities the labourer purchases wheat, as in Devon (Case 134), Dorset (Case 197), Wilts (Case 225), Beds (Case 449); and at Harpenden Mr. Lawes enables them to buy wheat at the wholesale price, and with some advantage as to credit. In all these cases the wheat is sent to the miller, who charges a certain sum for grinding it, and returns all, except that included under the head of loss, or he takes a toll of part of the flour, or the whole bran, in return for the grinding. The quantity of flour obtained from a bushel of wheat varied with the quality of the grain—from 43lb. to 47lb., and the weight of the bran from 10lb. to 17lb. The bran is worth more than the cost of grinding, so that the farm labourer usually receives it, and sells it or feeds his pig with it, whilst he pays the miller in toll or in money. There can be no doubt that this plan is economical in the districts in which the facility for purchasing and grinding occurs, but the quality of the wheat is often very poor.

Use of flour.

Flour is chiefly used for making bread, but in many counties it is customary to make the Sunday's pudding with flour and suet, meat, or fruit, and in certain counties pudding is eaten several times a week, such are Cornwall, Lincoln, Surrey, Hants, Oxfordshire, Herts, Beds, Rutland, and York, as will be shown under the head of meals. In a few places I found the pudding was made only of flour and water.

Oatmeal. Used in small quantities.

Oatmeal was used by 20 per cent. of the families, but, with the exception of the northern counties, it was purchased in small quantities and at irregular intervals, and was chiefly used to make gruel. The quantity purchased varied from ½lb. to 2lbs. per week, and only in Westmoreland, Cumberland, and Northumberland was it made into cake. The cost now is always as great or greater than that of wheat flour, and hence, since the reduction in the price of wheat which has occurred of late years, the use of oatmeal has been discontinued in Derbyshire and other localities where it and brown bread were generally consumed.

Not preferred to wheaten flour.

There is no impression on the minds of English farm labourers that it is a better food than wheaten flour.

Maize not used.

Maize was not used in any case under enquiry, neither did I hear of its use in any part of England.

Barley.

Barley is still used in the north of England, where it is given to the labourers, as a part of their wages, and also in Cornwall and Devon, but nowhere in England is it a principal member of this class. Even

Its use diminishing.

in Northumberland its use is much diminishing; and in Case 288 was only used when there was plenty of milk. It was, however, remarked by the same person that it was good food.

Maslin.

Maslin is a mixture of rye and wheat, used in Yorkshire and the northern counties as a food which is somewhat cheaper than wheat flour. As there are no analyses of this grain on record I have taken much pains to ascertain its nutritive value, but have found that the proportion of the two grains was not uniform. Maslin is either grown as a mixed crop intentionally, or is mixed for sale. When grown, the relative quantity of the grain differs with the soil, so that in the lighter soils the proportion of rye is increased. Hence there is no uniform proportion maintained, but when it is mixed for sale it is usual to mix two parts of wheat with one part of rye. It is given to the labourer in Northumberland, as a part of the wages, but even then I

Not of uniform composition.

Given as an allowance.

did not find any case in which it was alone used as the principal bread stuff, but was sometimes purchased in equal weight with wheaten flour. It is baked into bread either alone or with the addition of flour.

Dried peas were purchased by about 15 per cent. of these populations, but chiefly, or exclusively, in the winter, when potatoes were scarce and dear. They were used in more than half the counties, but almost always in small quantities, and only in making soup.

Rice also was chiefly used in the winter time, to supply the place of vegetables, or at other periods when milk could be obtained with which to make puddings. It was used in small quantities by about 58 per cent. of the cases, and in nearly every county.

Such are the bread stuffs which are in use among these populations. The total average quantity of them, when reckoned as bread, was 12¼ lbs. per adult and 55¾ lbs. per family weekly. The quantity varied somewhat in the different counties. It was more than 15 lbs. per adult in Salop and Northumberland, more than 14 lbs. in Cambridgeshire, more than 13 lbs. in Dorset and Notts, and 13 lbs. in Suffolk; whilst, on the other hand, it was less than 10 lbs. in Cornwall, from 10 to 11 lbs. in Somerset, Cheshire, Lancashire, Stafford, Hants, Oxford, and Berks. In nearly ⅔ of the counties the quantity varied only from 11 lbs. to 13 lbs. per adult weekly. On the average this class of foods supplies $\frac{6}{10}$ of all the carbon and ⅔ of all the nitrogen contained in the dietaries, whilst in the poorest dietaries the proportion of carbon is much greater.

BREAD STUFFS.
Dried peas.
Rice.
Total consumption of bread stuffs.

It is a laborious matter to refer to the individual families in so large an enquiry, but it is necessary to do so in order to appreciate properly the diversity which exists in the amount of this most important class of foods. I will here relate the instances in which the quantity was very small and also very large.

Variation in counties.
In individual cases.

In one instance only 5¾ lbs. per adult were obtained weekly, and in seven cases the quantity varied from 6½ to 7 lbs. The first occurred in Hants (Case No. 373.), and the others in Somerset, Stafford, Hants, Berks, and York. In 2½ per cent. of the cases the quantity was from 7½ to 8 lbs., and those were in Cornwall, Devon, Somerset, Northumberland, Oxfordshire, Hants, and Beds. In 18 cases, or 5 per cent., it was from 8 lbs. to 9 lbs., and those were in Devon, Somerset, Worcester, Notts, Durham, Stafford, Warwick, Northampton, Surrey, and Berks; and in 17 cases, or 4½ per cent., it was from 9 lbs. to 10 lbs. Thus in 14 per cent. of all the cases the weekly quantity per adult was less than 10 lbs.

The consumption very small.

On the other hand, in 16½ per cent. of all the cases the quantity exceeded 15 lbs. weekly. Of these, two cases in Worcester and Surrey obtained nearly 27 lbs. each, one in Cumberland 21½ lbs., 4 in Dorset, Derby, Warwick, and Sussex, 19¾ lbs. Six in Dorset, Somerset, Northumberland, Sussex, Herts, and Hants, 19 lbs., and six in Devon, Somerset, Dorset, Worcester, Northumberland, and Cumberland, 18 lbs. Five cases ate 17 lbs., 15 cases (4 per cent.) 16 lbs., and 22 cases (6 per cent.) 15 lbs.; and these were in Devon, Somerset, Dorset, Salop, Notts, Northumberland, Durham, Northampton, Bucks, Rutland, York, Gloucester, Worcester, Leicester, Westmoreland, Warwickshire, Suffolk, Hants, Cambridge, Beds, Cheshire, Lancashire, Staffordshire, and Herts.

Very large.

It is remarkable that these extreme quantities in both directions were most widely distributed, and found in counties very diverse in the average results. A careful examination of the tables will render this still more striking, by showing widely diverse quantities placed side by side in the same county. Thus at Bideford, Devon, Case No. 162. obtained less than 9 lbs., whilst Case No. 163. had more than 18 lbs. In Somerset, Case No. 169. ate 18½ lbs., Case No. 170. only 6½ lbs., also

Both classes of cases found side by side.

APPENDIX.

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

ENGLAND.

BREAD STUFFS.

Case No. 187. 15 lbs., and Case No. 183. 7 lbs. In Durham, Case No. 290. obtained 14 lbs., whilst Case No. 291. had only 8½ lbs. Case No 300., in Cumberland, ate 21¼ lbs., whilst only 6½ lbs. fell to the lot of Case 312., in Staffordshire. In Warwickshire, Case No. 316. had less than 9 lbs., and Case No. 293. had 19½ lbs. In Surrey, Case No. 371. ate 26 lbs., and Case No. 374., in Hants, 14½ lbs., whilst Case No. 373., in the latter county, had only 5⅔ lbs. per adult weekly. Many other instances may be found in the tables, but these will suffice to show how closely extremes meet in the same class of persons living, it may be, in the same village. It may also be well to point out how very different is the condition of those populations living in different and yet not distant villages of the same county, as may be seen in Devon, in the farm labourers living in Hatherleigh, Cases No. 153., &c., and in Merton, Cases No. 125., &c.; also in Staffordshire, at Wigginton, Cases No. 307., &c., and at Hyde Lea, Cases No. 311, &c. It is so marked and occurs so frequently that it must be less due to these populations themselves than to the influence of others upon them,—a liberal or illiberal employer, or a kindly or exacting landlord. This is strikingly the case at Merton, with its excellent and cheap houses, its large National School and cleanly streets, and the higher wages which Lord Clinton pays to his labourers.

POTATOES.

Not eaten in uniform quantity throughout the year.

The quantity of potatoes consumed by these populations varies both with the season of the year and the opportunity which they have to produce them. Their use is the most plentiful at the end of summer and the beginning of winter, when the new crop is ripe. I found but few families who so divided their supply as to have them in their usual quantity throughout the whole winter, and in none was there a sufficiency left for the spring season. Hence in the later part of the winter and throughout the spring it was usual to go without potatoes, or to purchase them, and to eat them in small quantities only. As my enquiries were made from the latter part of spring throughout the whole summer, that is to say, at the periods when the supply of potatoes varied much, I obtained returns which cannot properly be compared with each other, for since there is a compensation effected between the quantity of bread and potatoes eaten, I was obliged to take the details of the dietary then existing at the period of the enquiry, and not an average of the quantity of potatoes which would be eaten throughout the year. It is therefore very probable that the returns obtained would be somewhat below the yearly average. The tables show that in 87 per cent. of the cases potatoes were eaten at the period of the enquiry, and that the total average consumption was 27 lbs. per family and 6 lbs. per adult weekly. The counties in which some of the families under enquiry did not eat them were Cornwall, Devon, Somerset, Dorset, Wilts, Salop, Cheshire, Stafford, Norfolk, Berks, Herts, Cambridge, Beds, Rutland, and Yorkshire.

Returns not strictly comparable.

Quantity consumed.

Importance of.

The free supply of potatoes is of the highest importance to these populations in an economical point of view, for three reasons:—*First*, their production is effected at a very small cost of money, and chiefly by the labour of the labourer or his family, which could not in any other mode be converted into money, and which is therefore a substantial addition to his wages. The cost of the potato ground is mentioned in the tables, and in some instances was so high as 10*l.* per acre, but usually the price was from 3*l.* to 4*l.*, and in many localities it was let from motives of philanthropy at a merely nominal value. As an instance of the latter kind I may mention the practical benevolence of Mr. Merry, in the parish of Shinfield, Berks, and the rector of Kegworth, Notts, and as an example of intelligent aid to the poor, that of Mr. Lawes, at

Grown at small cost.

Harpenden, Herts. *Second*, when obtained they supply so much nutriment as to enable the labourer to dispense with a portion of bread, and thus to save money for other necessary purposes. Thus in Case No. 146 (one of the best arranged dietaries in the kingdom), the potatoes saved 2*s.* a week in bread. Case 341 supplanted 28lbs. of bread by 56lbs. of potatoes. In Dorset one family saved 14 lbs. of bread when potatoes were plentiful. Case No. 272, Cheshire, saved 5½ lbs. of flour. Case No. 393, Berks, saved 4lbs. of bread by having 28lbs. of potatoes. In Beds, one family saved a 4lb. loaf, and in York, another 18lbs. of flour. There was much diversity in the relative amount of nutriment contained in these practical equivalents of bread and potatoes. As a rule the addition of potatoes in England does not so diminish the supply of other foods as to lessen the total nutritive value of the whole, but, on the contrary, in almost every instance the total nutriment is increased. *Third*, the poor find in practice that they can make up a dinner or a hot supper with potatoes added to the morsel of meat and bacon which they have, when otherwise it would be a dry, cold, and uninviting meal; and it must be always borne in mind that the "making-up" of a meal is a most essential part of the duties of the housewife in managing the very limited resources at her disposal, and affects her selection of food of every kind. Any cooked potatoes which have been left from the dinner may be warmed up with a little fat for supper without much cost in fuel.

Save other food.

Make up hot meals.

In addition to all this it may be added, that those who grow a plentiful supply of potatoes sometimes feed a pig upon them, or sell them, and thus bring in ready money to the family.

May feed pig or sell them.

When potatoes must be purchased, there is an universal belief, as in Case No. 478, that they are a dearer article of food than bread.

When dearer than bread.

The above remarks also apply in a limited degree to the use of green vegetables. This is the most abundant and of the greatest value in the spring and early summer seasons, when there are no potatoes, or when potatoes are scarce and dear, and then they are eaten daily, and in many places, as Devon, Cambridge, York, &c., are cooked twice a day. At other periods the supply seldom allows of their use more frequently than once or twice a week, and usually they are reserved for the Sunday's meal.

GREEN VEGETABLES.

There is a limitation in the use of the principal member of this class, cabbage, which is not experienced in reference to potatoes, viz., it cannot be eaten without fat or meat. When a little meat or bacon can be fried with it, or in the absence of these when dripping can be used, the cabbage is fried for dinner, or in the summer time more usually for supper, and forms a hot meal for the labourer and his family. Hence, even when it is plentiful, its use is limited as to frequency, but it is sometimes very large as to quantity. Onions are used very extensively, and give a savoury relish when bread is the chief article of which the meal is composed, as well as when a little meat is cooked. They are almost invariably added to the Sunday's meal, and when plentiful are used almost daily by those whose dietary is the poorest. They have the advantage over other kinds of green vegetables, that they may be eaten whilst growing, and also preserved for use in the winter. I was not able to estimate the quantity of other green vegetables than cabbage, but, on enquiry, I did not find that turnips formed so noticeable a part of the dietary in the poorest districts as has been stated.

Limited use of cabbage.

Onions.

Turnips.

SUGARS.

Sugars were used by 98 per cent. of the populations in an average quantity of 33¾ oz. per family, and nearly 7¼ oz. per adult, or in round numbers 2lbs. per family and ½lb. per adult weekly. Of these, 62 per cent. used sugar and 52 per cent. treacle. The quantity varied

Average quantity and extremes.

very greatly in the different counties, the extremes being 3¼ oz. in Somerset and Dorset, and 16 oz. in Lancashire per adult weekly. As the use of it is somewhat costly in relation to the nutriment obtained, and is a luxury to be reduced in quantity under the pressure of pecuniary need, it may be well to point out the counties in which the extreme quantities were eaten.

Thus the quantity was under 4 oz. per adult weekly in Somerset and Wilts; from 4 to 5 oz. weekly in Cornwall, Devon, Wilts, Hants, Bucks, and Beds; and from 5 oz. to 6 oz. in Norfolk and Oxford; all counties in which the general dietary is low. On the other hand, it was 16 oz. in Lancashire, 15 oz. to 16 oz. in Cheshire, 14 oz. to 15 oz. in Warwick, 13 oz. to 14 oz. in Cumberland, 12 oz. to 13 oz. in Northumberland, 11 oz. to 12 oz. in Stafford, Suffolk, and Kent, and 10 oz. to 11 oz. in Leicester, Derby, Westmoreland, Rutland, and Yorkshire. Hence in 27 per cent. of the counties the quantity consumed was 6 oz. or less; in 38 per cent. it varied from 6 oz. to 10 oz.; and in 35 per cent. it was above 10 oz. per adult weekly. Its use was most limited in the five south-western counties, viz., Cornwall, Devon, Somerset, Wilts, and Dorset, where on the whole average it was only 4·1 oz. per adult. Moreover, in Devon, treacle was used more than twice as frequently as sugar, whilst the latter was most rarely given to any member of the family other than the infants (Case No. 169). In no county was treacle eaten by every family.

A luxury. Average in counties. Where least.

Sugar was almost universally regarded by the poor in part as a luxury, and in part as a necessary. In Devon and other counties, where milk is obtained plentifully, it was either not eaten at all, or in very small quantities, so long as milk was abundant, as in Cases Nos. 175 and 177, but in counties where the supply of milk is small and uncertain, and where the use of tea enters largely into the dietary, its use is more abundant. Hence by the very poor, and those who obtain plenty of milk, it is regarded as a luxury, whilst by those whose means are less limited, or who take much tea, it has come to be regarded as a necessary. There are, however, some of the poorest districts where tea is much drank, but without the addition of sugar or milk. In the fruit season its use is necessarily increased. The use of treacle has another relation, viz., to that of butter, so that in the poorer families, where butter or other fat is obtained only in very small quantities, or on the days in which the supply of fat is exhausted, as also at the seasons of the year when butter is dear, treacle is obtained for the use of the children. There is, however, a general belief that treacle is not a cheap food, perhaps on the ground that it is absorbed by the bread, as remarked by Case 453, and then does not satisfy the children, but makes them ask for more (the satisfaction of the sight being a very pressing item in the arrangement of the poor man's dietary); but as the price in the country districts is usually 3½*d.* to 4*d.* per lb., whilst that of sugar is only from 4*d.* to 5*d.* per lb., there are good grounds for the opinion. This is one of the foods which at a lower price (viz., the price of it in London,) could be most advantageously extended among the poor.

Relation to other foods. As milk. Tea. Fats. Treacle not a cheap food. High price in the country.

FATS. Average quantity. Frequency of use.

Separated fats, as butter, dripping, lard, or suet, were obtained by 99 per cent. of the whole cases, and in an average quantity of 25 oz. per family and 5½ oz. per adult weekly. Of these, butter was by far the most universally eaten, viz., by 97 per cent. of all the cases, whilst lard or dripping was eaten by 54 per cent. and suet by 62 per cent.; but in reference to the latter it should be added, that suet in very small quantities was often weighed with the meat when purchased; and in some cases where a pig was fed and killed the quantity of lard produced and eaten could not be estimated correctly, so that some slight

addition to the frequency with which these fats were eaten might perhaps be admitted.

Fats were regarded less as luxuries than sugar, and although the quantity of them was diminished in periods of pressure, it was also increased in the summer time, when means of living were less scanty, and the price of butter much reduced. I found much difference in the economy with which these expensive foods were purchased, so that in succeeding cases it often occurred that one bought salt butter at 10*d.* or 1*s.* per lb., and another gave 1*s.* 5*d.* per lb. for fresh butter. In some instances, when the food was obtained from the employer, the price was moderate, and the same all the year round. Others, but few, however, in proportion to the whole, felt the importance of dripping as a cheaper food, and eagerly purchased it, whether at the house of the squire or in the ordinary shops. In this respect some were more highly favoured than others, for since the supply was nowhere equal to the need, certain persons received it as a favour from the wealthy families, and sometimes paid as little as 4*d.* per lb. for it. In a few localities, as in Wilts, the butchers render down the spare fat, and sell it as dripping at 5*d.* to 6*d.* per lb. The counties in which all the families visited did not purchase butter were Devon, Somerset, Dorset, Lincoln, Notts, Stafford, Northampton, Rutland, and York. Dripping was obtained by all the families in only three counties, viz., Durham, Suffolk, and Kent. The quantities of separated fats which were eaten varied much in different counties, and the following are the extreme cases:

Less a luxury than sugars.

Variation in economy.

Butter.

Dripping.

Where not universally used.

Below 3 oz. in Norfolk, 3 oz. in Somerset and Herts, from 3 oz. to 4 oz. in Devon, Gloucestor, Lincolnshire, Notts, and from 4 oz. to 5 oz. in Cornwall, Dorset, Bucks, and Hants. On the other hand, it was upwards of 14 oz. in Kent; 10 oz. or above in Durham, Lancashire, and Surrey, and from 8 oz. to 10 oz. in Cumberland, Suffolk, Sussex, and Berks Thus Norfolk on the one hand and Kent on the other were remarkable as extremes; but in no less than half of the counties the quantity consumed per adult weekly varied only from 5 oz. to 8 oz.

Butter.

Dripping.

Where extreme quantities eaten.

Of the individual cases it has been shown that 1 per cent. did not obtain any fats, and a reference to the tables will prove that the quantity *per family* was only ¼ lb. or less per week in 9 cases (2½ per cent.) living in Cornwall, Devon, Somerset, Dorset, Wilts, Salop, Notts, and Stafford, viz., the poorest counties, and was only from ¼ lb. to ½ lb. weekly in 35 cases (9½ per cent.) in Cornwall, Devon, Somerset, Dorset, Wilts, Gloucester, Notts, Derby, Norfolk, and Bucks. Of the latter no fewer than 20 lived in Devon and Somerset alone, so that in these two counties nearly 30 per cent. of all the cases did not have an average of more than ½ lb. weekly of all the separated fats combined. On the other hand, 22 cases (6 per cent.) occurred where the weekly consumption *per family* exceeded 3 lbs., and 8 cases (2 per cent.) when it was so large as 4 lbs. and upwards per week. Those cases were found in Dorset, Wilts, Gloucester, Cheshire, Derby, Durham, Westmoreland, Cumberland, Lancashire, Northampton, Suffolk, Kent, Sussex, Surrey, Berks, Herts, Cambridge, Beds, Rutland, and York; so that Somerset and Dorset exhibited the extremes side by side.

Individual cases.

Supply very small.

Large.

It was only in a few families comparatively that butter was eaten every day, since the poorer for the most part had two days a week in which the children ate dry bread. When the supply of meat and bacon was exhausted, the labourer himself took bread and butter or bread and cheese with him for his dinner, and thus exhausted the supply for the other members. Dripping, like butter, was nearly always used to spread upon bread, and when cabbages were cooked it sometimes supplied the fat in which they were fried. The use of it in puddings was unfrequent.

Not eaten daily.

Butter.

Dripping.

Suet was always used in puddings, and as pudding was in the majority of cases limited to Sunday it was used but once a week. In those counties, however, in which flour puddings are more frequently eaten, a little suet is saved for some of those made during the week, and when fruit is abundant it is more frequently used. The quantity purchased varied from $\frac{1}{8}$ lb. to $\frac{1}{2}$ lb. weekly.

I now come to treat of a class of foods which in reference to the dietaries of the working man and the public dietaries of prisons and workhouses is now attracting great attention, viz., meats. I have included bacon and meat together, under the head of meats, for the reasons,—1st, that in practice the labourers interchange them according to the season of the year and other circumstances; 2d, that if they can purchase bacon, the more costly food, they might à fortiori purchase butchers' meat, the less costly food, if they deemed it better to do so: and, 3d, in many counties a kind of meat, pickled pork, which is intermediate to the two, is almost exclusively used. But besides all this, the nature of bacon and butchers' meat is the same, and they differ only in the relative quantities of carbon and nitrogen which they contain, bacon being about $\frac{1}{2}$ richer in carbon, and meat $\frac{1}{2}$ richer in nitrogen. There is not, therefore, that wide distinction to be drawn between the use of the two foods as is implied in the often-heard expression in reference to the labourers in the south-western counties, "Oh, they only get a little bacon; they never eat meat;" but, on the contrary, it will be shown that in practice bacon is selected by the poor on good grounds. In this class of foods, as in that of sugar and fat, I have sought the average quantity eaten under ordinary circumstances, and not, as in the case of fresh vegetables and bread, the quantity obtained at the period of enquiry.

Suet.

MEATS.

Relation of bacon and butchers' meat.

Not widely different.

Frequency of use.

Meats were eaten by 99 per cent. of all the families visited throughout England. Bacon was obtained by 74 per cent. and butchers' meat by 70 per cent., and the two together were eaten by the same family in 46 per cent. Hence 30 per cent. never ate butchers' meat, or obtained it so unfrequently and in such small quantities that it could not be averaged in quantities of 1 oz. per family in a weekly dietary. In some districts it was very lean and poor, and the product of sick sheep killed on the farm, and taken by the labourers as a part of their wages. Somerset and Wilts were the only counties in which all the families visited did not obtain one or other of these foods. Those in which some families did not obtain butchers' meat were Cornwall, Devon, Somerset, Dorset, Wilts, Gloucester, Worcestershire, Salop, Lincoln, Cheshire, Cumberland, Stafford, Norfolk, Suffolk, Essex, Sussex, Surrey, Hants, Oxford, Berks, Herts, Cambridge, Beds, and Yorkshire, and were situate in every part of the country. The counties in which the proportion of those who obtained bacon, and did not have butchers' meat, was very great were Devon, Somerset, Dorset, Wilts, Gloucester, Salop, and Cumberland, and of these the four latter were the most noticeable. On the other hand, in some counties meat was eaten by the families much more frequently than bacon; and as marked instances I select Lancaster, Northampton, Essex, Bucks, Herts, Huntingdon, Cambridgeshire, Beds, and Rutland; but in most of them the intermediate flesh, pork, was the meat preferred.

Where neither.

Butchers' meat not obtained.

Where most frequently used.

Bacon.

Butchers' meat.

Average quantity:

Where below:

Above.

The total average quantity eaten was 72¾ oz. per family and 16 oz. per adult weekly, varying in extremes in the different counties from 5½ oz. in Salop to 29½ oz. in Durham per adult. The counties in which the average quantity was below 12 oz. per week were as follows:—7 oz. and below, Salop, Essex, Somerset, Wilts, and Norfolk; from 7 oz. to 8 oz., Dorset and Gloucester; from 8 oz. to 10 oz., Warwick and Hants; and from 10 oz. to 12 oz., Devon. On the other hand, there were

numerous counties in which the quantity exceeded 20 oz. per adult weekly. There were from 20 oz. to 24 oz. in Cornwall, Lincoln, Notts, Westmoreland, Huntingdon, and Beds; from 24 oz. to 30 oz., in Durham, Lancaster, Northampton, Surrey, and Yorkshire; and in Northumberland it was so high as 35 oz. per adult weekly. Hence the least quantity of meat was consumed in the poorer counties, with one or two exceptions; and in only 40 per cent. did the limits lie within 4 oz. above and below the average quantity.

It will also be necessary to determine the proportion of the individual cases in which the quantities were extreme in both directions. There were 81 cases, or 21 per cent., in which the quantity consumed was less than 2 lbs. weekly per family, and of these 30 cases, or 8 per cent. of the whole, ate only from $\frac{1}{4}$ to 1 lb. per family. Of the latter 21 of the 30 cases were met with in Devon, Somerset, Dorset, and Wilts, and constituted 22 per cent. of all the cases in those counties. In Somerset 35 per cent. and in Dorset 32 per cent. did not obtain more than 1 lb. per family and only $\frac{1}{5}$ lb. per adult weekly. The other instances occurred in Gloucester, Salop, Cumberland, Norfolk, Essex, Rutland, and Herts. The families which obtained an average quantity of from 1 to 2 lbs. weekly were nearly 14 per cent. of the whole, and in Devon, Dorset, Wilts, Gloucester, and Salop, they constitute 32 per cent. of all the cases in these counties. Hence, if we take all the instances in which less than 2 lbs. of meat per family were eaten in Devon, Somerset, Dorset, Wilts, Gloucester, and Salop, we shall find them to amount to nearly 50 per cent. of the whole of these populations. The remaining instances in which only from 1 to 2 lbs. of meat were obtained by a family were widely distributed in the counties of Chester, Derby, Westmoreland, Stafford, Norfolk, Suffolk, Essex, Kent, Sussex, Surrey, Hants, Oxford, Berks, Rutland, and Herts.

Relation to general dietary.
Individual cases.
Extremes.
Quantity: Very small:

But the families which obtained more than 6 lbs. of meat weekly were much more numerous than those obtaining only 2 lbs. or less,—so many as 30 per cent. of the whole. 68 families, or 18 per cent., obtained from 6 lbs. to 8 lbs.; 24 families, or 6½ per cent., from 8 lbs. to 10 lbs.; 16 families, or 4½ per cent., from 10 lbs. to 12 lbs., and 3 families obtained so much as from 12 lbs. to 14 lbs. per family weekly. These instances were met with in every county of England. The highest series occurred in the counties of Northampton and Beds, the next in Warwick, Salop, Notts, Northumberland, Durham, Warwick, Rutland, Hunts, Cambridge, Beds, and York, and the third series in Cornwall, Notts, Derby, Northumberland, Stafford, Warwick, Northampton, Oxford, Herts, Hunts, Cambridge, Beds, and York.

Larger.
Greatest.

Thus the high and the low series often occurred in the same counties, even in the poorest; and it is worthy of note that Cornwall, Beds, and some other counties which rank low in the general average amount of nutrition are placed high in the quantity of meat consumed.

Both in the same counties.

There were some cases who obtained butchers' meat not only in very small quantities but at long intervals; so long sometimes as to prevent my estimating the average quantity. Thus, Cases Nos. 224 and 228 purchased a little once a month, Case No. 113. 1½ lbs. a month, Case No. 212. not once a month, Case 303. not once in 2 months, Case No. 469. not 1 lb. in 3 months, Case No. 479. none for months, Case No. 231. not twice in 7 months, Case No. 470. thought butchers' meat was necessary, but yet used 6 lbs. of bacon weekly, and had not purchased butchers' meat thrice a year; and Case No. 381. never ate it.

Eaten at long intervals.

As to the kind of butchers' meat selected, beef and mutton were the most common, and of these the breast of mutton and the flank of beef were preferred, on account of the lower price at which they were sold.

Kind of butchers' meat selected.

Beef and mutton.

Sheep's head and pluck.

Ox-head.

Mode of cooking.

Pork almost exclusively used.

Why.

Waste is less in cooking.

Why bacon preferred.

Sheep's head and pluck, being a cheap food, was somewhat frequently chosen by those who did not obtain butchers' meat regularly, as Cases No. 178. Dorset, No. 234. Gloucester, No. 226. Wilts, No. 244. Salop, and No. 344. Oxford. Others, but fewer in number, purchased half a cow's-head every week, or at longer intervals, as Cases No. 211. Wilts, Nos. 472. and 481. York. It was usual to boil the heads, whether of sheep or oxen, and to make broth, which, in the case of the ox-head, served the children through the week, whilst the meat was eaten at the Sunday's dinner, and by the husband during the week, and the fat was skimmed off, and used as dripping. In some instances it was used in the winter only, when the hot broth was considered to be more necessary. There was a general belief that beef was better food than mutton, but the high price at which it was commonly sold in country places, or, in other words, the deficiency in the supply of the cheaper parts, prevented its general use.

There were certain counties in which pork was almost the sole kind of meat obtained. These were Somerset, Dorset, Norfolk, Suffolk, Essex, Bucks, Herts, Hunts, Cambridge, and Beds, and particularly the four latter. It was rarely cooked whilst fresh, but was either bought after it had been pickled, or half or a quarter or less portion of a pig was purchased at a time when fresh, and after it had been in a pickle for a certain period was ready for use. When they killed their own pig the whole was pickled, and kept in pickle for a whole year. Case No. 426. The universality of its use in these counties is most striking, and caused me to seek to ascertain the ground for the selection. I therefore enquired of all the intelligent labourers' wives, and received various answers. No. 136. Devon remarked that it could be fried in small quantities more conveniently than other kinds of meat. In Hertfordshire some said that it was cheaper, as the children ate less of it; others that it could be more conveniently divided; others that it satisfied more; and other still that it wasted less in cooking. In reference to these answers, it must be borne in mind that the wife's knowledge as to the nutriment obtained is small, but she has gained by hard experience acute perception as to the food which most satisfies the children, and which can be so divided as to offer the greatest number of slices, and therefore to supply the greatest number of meals. Pork is not liked by the children, because it is fat; and as they dislike fat they are the sooner satisfied, at least so far as that dish is concerned, and thus a larger portion is left for careful distribution to others. It is a singular and in a sense an absurd reason, but it is the true one. The children prefer lean meat, and the mother believes that it would be more useful to them, but meat shrinks much in cooking, and the children would eat so much of it that they could not be satisfied with the small portion which must fall to their share. Hence a kind of meat must be selected which they like less.

Similar answers were given to the question why so many prefer bacon to butchers' meat. It is almost universally held to be cheaper and more convenient, because it does not shrink when boiled,—provides fat in which the cabbage may be boiled,—may be cut up easily into small portions, and fried, producing dripping for the children to be eaten with dry bread and bacon for the parents, or making a sapid dish with greens or potatoes,—can be kept in the house and eaten at any time, whilst in country places butchers' meat can be purchased only on one day in the week, and is usually bought from the grocer, who is accustomed to give them credit, which the butcher does not. Hence, as a general expression of some of the foregoing qualities, it is said to go further than meat, Cases 152, Devon; 168, Somerset; 241, Worcester;

386, Oxford; 390, Berks; and 547, York. Case No. 244 believed that it was not so nutritious as meat, whilst Case No. 390 was of the contrary opinion. Of late years, American bacon has been generally introduced into our towns and villages, and can be purchased at from 4*d.* to 6*d.* per lb., whilst the English bacon costs 8*d.* to 10*d.* per lb. I found many who objected to its flavour, and on that account, as well as a general prejudice which exists against purchasing articles of food which are accounted inferior (Case 218), many pay out of their little income 9*d.* and 10*d.* per lb. for English bacon. The introduction of the American bacon has been of great service, both in town and country, but less so in villages than it deserves. This was well acknowledged by Cases Nos. 139, 163, 191, 195, and 201. There is, however, a difference between the two kinds, in the process of cooking, which influenced many minds. Thus it shrinks much in boiling, and as the value of the liquor is not duly estimated they regard the diminution in the number of slices which can be cut from it as an unmitigated evil. On the other hand, it does not yield so much fluid fat when it is fried, and hence does not satisfy the children. It should also be added, that the samples of it in villages are often very inferior in quality, and the price is not reduced so low as it is in large towns. Its use is, however, extending, and should be universally encouraged.

With regard to the consumption of the meat or bacon, the following statements may be made. Universally, the dinner on Sunday is better than that on other days, because, in many instances, in addition to other reasons, it is the only dinner at which all the members of the family can assemble. The meat or the bacon, when the whole quantity is small, as 2lb. to 4lbs., is commonly cooked for this dinner, and all partake of it. What is left is reserved for the husband, who either takes a little portion with him for his dinner daily, or eats it at home; and it is most remarkable that this is not only acquiesced in by the wife, but felt by her to be right, and even necessary for the maintenance of the family. The remark was constantly made to me, "that the husband wins the bread, and must have the best food." If the family be thrifty, the husband will have a morsel of meat or bacon daily throughout the week, but in other instances the whole is consumed in the first two, three, or four days. The important practical fact is however well established, that the labourer eats meat or bacon almost daily, whilst his wife and children may eat it but once a week, and that both himself and his household believe that course to be necessary, to enable him to perform his labour. It is usual, also, when the husband cannot take his dinner with his family, to provide a hot supper at which a little bacon or meat is fried, when there are vegetables to eat with it, and hence it sometimes occurs that a little meat is eaten twice a day. At this meal all assemble, and as it is the only hot meal in the day it is greatly enjoyed. (Cases Nos. 236, 229, 231, and 379.) Cases No. 380 and 385 had hot suppers thrice a week. There are also many instances in which the husband cannot take either his breakfast or his dinner at home, and in such it is usual for him to take boiled bacon and bread with him for both those meals. Some take cheese instead of bacon, but generally, as in Case No. 228, bacon is believed to be cheaper than cheese.

Fish does not form any important part of the dietary of farm labourers in England, except where they live upon a coast where fishing is carried on, as in Devon, near to Plymouth. Herrings were occasionally purchased when fresh and in the season, and were a cheap dish. They were more generally used in the dried state, but the quantity was very variable, and the intervals very uncertain. They

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FISH.

MILK.

Variation in the supply.

Causes of.

were, however, purchased so frequently as to enable me to average them in 13 per cent. of all the cases. In no case were they made a constant part of the dietary, but their use was most abundant and frequent in the winter season, and at all periods of the year they were purchased only when on any given day meat or bacon failed. The numbers eaten varied from one weekly to one daily, and are given in the Tables.

This important article of food was obtained with much variation as to abundance and cost in different counties and even in the same village. In dairy counties, as Devonshire, it was obtained readily, abundantly, and cheaply, but only in the form of skimmed milk and buttermilk, the new milk being reserved for the purpose of making butter. In districts where cheesemaking was the important part of the dairy work, it was most difficult to obtain either new milk or skimmed milk, since the whole milk was subjected to the process of cheesemaking, and all that remained was whey. In districts where the fattening of cattle and sheep was the principal occupation, or where the land was chiefly under plough, exceedingly few milch cows were kept, so that the farmer himself could scarcely obtain milk for his own use. Then, again, in districts bordering upon great towns, as several counties in the neighbourhood of London, and even some villages in the neighbourhood of smaller towns, as Oakham in Rutland, the milk is taken away from the neighbourhood where it is produced and sent to the town. I found several families who kept a cow or joined another family in doing so, either paying for pasture, or, in Yorkshire and Warwickshire, being able to keep the cow in the lanes gratuitously. In such cases the cow was usually a small one, but gave milk enough for the family and for sale to their neighbours. Such persons were evidently much benefited by it. I also found some who were compelled by the parish to pay for the food which the cow obtained in the lanes. Hence, as one or the other of these conditions existed, the inhabitants were able or not able to obtain any kind of milk, or must be content with new milk, skimmed milk, butter milk, or whey, as they might obtain it. Moreover, there were strictly personal questions which influenced the sale. Thus, in a village the supply might be in the hands of one farmer, and be insufficient for the wants of the whole neighbourhood, and hence he selected his customers, generally supplying the wants of his own labourers first, and then others who had claims upon him. Thus some would have it, and others living at the next door could not obtain it. Further, in many districts, and those perhaps where the farms are the largest, as in Wiltshire, the farmer finds it a trouble to serve the skimmed milk to the customers. The dairymaid is needed for other work, and the mistress thinks it below her position; and hence he gives it to his calves, pigs, and hounds, and refuses it even to his labourers. I found families living in the midst of plenty of this kind of food who would have willingly purchased it, but had not been able to obtain it for two years, and where, in consequence, the health of the children suffered, as Case 229.

Labourer keeps a cow.

Farmers prefer not to sell it.

Regularly given or sold

In certain parts of the country, as in Cheshire near to Macclesfield, the abourers have skimmed milk given to them regularly by their employer (Case 370.) Others have provision made for a regular supply from motives of benevolence, and obtain it either daily or on alternate days, in regular order, in a certain quantity, and either at a small cost or without charge, as in the instance of Lord Bath's tenantry at Hornings-ham, and the poor neighbours of Mr. Merry, near Reading. The following cases stated that the farmers in their locality would not sell

Farmers refuse to sell it.

milk :—Nos. 186 Somerset, 225 Wilts (she had brought up five children, and the whole had not drank one gallon of milk), 228 Gloucester, 242 Salop, 251 Lincolnshire, 342 Suffolk, 443 Beds, and others residing in Oxfordshire, Bucks, Herts, Huntingdon, Cambridge, and Rutland. In some of these instances it may be that the supply was quite unequal to the need, and not always that the farmer having it refused to sell it, although such was the statement made by the labourers, and, moreover, such conditions did not apply to the several counties universally. I found also many instances where the families were unable or unwilling to walk to a distant farm daily to obtain milk which they could not otherwise have; such was the case in Worcestershire. It has been already stated that in the middle of summer skimmed milk and butter milk become sour before they are sold, and cannot then be cooked, so that at the period of greatest abundance the value of them is much lessened. There are also many places, as in Beds and Yorkshire, where the supply of skimmed milk to the labourers is greater in winter than in summer, viz., at the period of least production. In those districts where the milk is kept long before being skimmed, or, as in Devon, where heat is applied so as to remove the whole of the butter from the milk, the skimmed milk is less valuable than the butter milk, since whilst the latter has as much nitrogen as the former, it has portions of butter remaining in it, and thereby is richer in carbon. In many parts of England, as Devon, butter milk is given to the poor, whilst in others it costs ½*d.* per pint.

Variation of supply with season.

Why skimmed milk sometimes less valuable than butter-milk.

There is also a peculiar custom in certain parts, as in Devon, Somerset, and Dorset, for the labourers to be allowed by the farmer to purchase ¼ pint of cream for 1*d.* on Saturday, and this in some cases is the nearest approach to milk which he obtains, except in case of illness.

Cream.

I have under the general term milk included new milk, skimmed milk, and butter milk, and 76 per cent. of the whole cases obtained one or all of them. There was not any county in which milk was not obtained; but in only 11 counties, viz., Cornwall, Devon, Worcester, Notts, Leicester, Derby, Northumberland, Westmoreland, Lancaster, Northampton, and York, did all the cases have it. Of the whole, 26 per cent. only obtained new milk, 53 per cent. skimmed milk, and 7 per cent. butter milk. The total average quantity consumed was 7·3 pints per family, and 1·6 pints, or 32 fluid ounces, per adult, weekly. The quantity per adult weekly varied much on the average of the different counties, in extremes of ¾ of an ounce in Gloucestershire to 120 ounces in Westmoreland. It was 2 oz. in Surrey; from 2 oz. to 10 oz. in Essex and Cambridgeshire; from ½ pint to 1 pint in Somerset, Dorset, Wilts, Staffordshire, Northamptonshire, Kent, Sussex, Oxfordshire, Berks, Bucks, Herts, Hunts, and Cambridgeshire; from 1 pint to 2 pints in Leicestershire, Derbyshire, Warwickshire, Norfolk, Suffolk, Beds, and Rutlandshire; from 2 pints to 3 pints in Cornwall, Devon, Worcestershire, Salop, Lincolnshire, Notts, Cheshire, Durham, and Cumberland; from 3 pints to 4 pints in Lancashire and Yorkshire; 4½ pints in Northumberland, and 6 pints in Westmoreland. As a general rule it may be stated that new milk was sold at 1*d.* to 1½*d.* per pint; skimmed milk at ¼*d.*, ½*d.*, and ½*d.* per pint; and buttermilk at ½*d.* to ½*d.* per pint, and the lowest prices occurred where the quantity consumed was great. The tables will also show that the places where skimmed milk was plentiful and cheap were those in which the largest amount of nutriment was obtained in relation to its cost; and nothing can be so important to the labouring classes as an extension of the facilities for obtaining a plentiful supply of this cheap and most important food. The use of butter milk as an article of human

Frequency of use of new milk, skimmed milk, and butter milk.

Average consumption.

Variation in counties.

Price.

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MILK.

Whey.

CHEESE.

Price.

Relation to other foods.

Relation of cheap and high priced cheese.

Cheapest supply of nitrogen.

Where most frequently used.

Average quantity.

Extreme variations.

Quantity.

Very small.

Very large.

Other variations.

food in England is much too small, when its nutritive value, small cost and large supply are considered. Whey is almost universally given to the pigs in England, even when the labourer keeps his own cow; and in only one instance did I meet with its use in human food with any degree of regularity; that was in the cheesemaking county of Cheshire.

Cheese is very variously estimated in different parts of the country; a fact in great part due to the difference of cost. Generally the price is from 8*d.* to 10*d.* a lb., and where such was the case the labourer often remarked that he could not afford it. In certain counties, as Somerset and Dorset, there is a skimmed milk cheese produced, which is sold at 2½*d.* to 3½*d.* per lb., and is there largely used. As cheese is used practically as an equivalent for three articles of food, viz., milk, butter, and meat, and to supply a deficiency in any or all of them, it is much to be regretted that the cheap form of cheese is not more widely attainable, for although it may not be so easy of digestion as the cheese which is richer in fat, it is itself richer in nitrogen than any other article of food, and when neither just made, nor more than one year old, may be eaten without disadvantage. It is the cheapest mode of obtaining nitrogen, except skimmed milk and butter-milk, costing ¼ per pint. Cheese was eaten in every county, but in only six counties was it obtained by every family under enquiry. These were Gloucester, Durham, Sussex, Surrey, Hants, and Rutland. The total average quantity supplied was 24 oz. per family and 5½ oz. per adult weekly; but the variation in the different counties was very considerable. Thus, to take extreme cases, and yet counties adjoining each other: in Cornwall, only ½ took cheese, and that only 2 oz. weekly, and in Devon $\frac{2}{3\frac{1}{2}}$ ate it in a total quantity of 1¾ lbs. weekly. These gave an average of ¼ oz. and ¾ oz. for each family in the two counties respectively, and could not be computed per adult. Whilst in Somerset $1\frac{1}{10}$, in Dorset $1\frac{8}{9}$, and in Wilts $1\frac{1}{7}$ of all the families ate it, and on a total average quantity of 20½ oz., 61¼ oz., and 24½ oz. per family, or of 4¼ oz., 12½ oz., and 5 oz. per adult weekly, in each of these counties in their order. The counties in which the quantity was less than 1 oz. per adult weekly were Cornwall, Devon, Lincoln, Notts, and York, and in ½ of all the counties it did not exceed 2 oz., viz. (besides the foregoing) Leicester, Derby, Durham, Westmoreland, Northampton, Norfolk, Oxford, Berks, Herts, Hunts, Cambridge, Beds, Rutland. On the other hand, 5 oz. to 8 oz. per adult weekly were eaten in Wilts, Gloucester, and Sussex, from 8 oz. to 10 oz. in Cumberland, Kent, and Surrey, and 12½ oz. in Dorset.

Various estimates of cheapness of cheese.

In the districts where the cheap cheese is largely used the labourers commonly obtain it by a cheese at a time from their employers, and pay for it by instalments. In these districts cheese is regarded as an inferior food, and is eaten by those who are too poor to obtain meat, whilst in others, as in Yorkshire, it is regarded as a luxury desirable, but not necessary, and beyond the means of the purchaser. The former are among the poorest, the latter among the richest in the dietary which the labourers obtain.

EGGS.

Eggs were not eaten by any large number of these populations, but when produced at home were commonly sold. I found some families in Yorkshire, Case No. 486, who obtained sea gulls' eggs, either by taking them from their nest, or by purchasing them at ½*d.* each. The large size of these eggs renders them a most economical article of food.

TEA AND COFFEE.

Frequency of use.

The use of tea may now be said to be universal, for 99 per cent. of these populations obtained it, whilst coffee was purchased by only 44 per cent. There is, however, practically a more general belief in the

identity of action of these two substances than these figures imply, for the selection is due to an economic cause, viz., that coffee cannot be drank without milk or sugar, whilst with tea one or both of these adjuncts may be dispensed with. Hence, even in the poorest districts, where the less cost of the coffee would otherwise give it a preference, it is found practically that the balance lies in favour of the tea. It may also be added, that commonly tea is more readily made than coffee, and by limiting the selection to one (and that one is never coffee) they need fewer utensils. The total average quantity of tea consumed was 2¼ oz. per family and ½ oz. per adult weekly. This, contrary to the course pursued with regard to meat, falls largely to the share of the wife and children, who take it twice and often thrice a day. A few remarkable cases, however, occurred to me where the husband drank tea or coffee very largely, by taking it with him to his work, and providing his breakfast and dinner meal. One of these, Case No. 225, consumed no less than 12 oz. of tea per week.

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TEA AND COFFEE.

There was more uniformity in the quantity of tea which was drank per family than occurred with any other food. Thus, on the average, the quantity was from two to three ounces in ⅔ of the counties, and exceeded 4 oz. in only one county, Cumberland, where the amount was 5¼ oz. per family. In only three families throughout the enquiry did the average quantity amount to or exceed 6 oz. weekly.

Tea preferred.

Average consumption.

In reference to its use, it must be borne in mind that the chief object is to obtain a hot meal; and this is readily furnished by the hot tea, with its agreeable flavour, and with the sugar and milk, when one or both are added. It is not regarded as nourishment, in the sense in which bread is eaten, and is not therefore nicely graduated in quantity to the number of persons contained in the family, but rather to the number of meals at which it is taken, and as these are much the same in all families, it tends to an uniformity in consumption which does not apply to any other article of food. That the use is almost exclusively restricted to the warm fluid which accompanies it may be inferred, 1st, from the necessity which exists for fluid—and where the dietary is poor, so as to produce little heat in the body, or the weather cold, so as to withdraw heat from the body, nothing can be more agreeable and valuable than to give heat directly to the body by hot foods; 2d, from the very small quantity of the properties of tea which can be consumed at a time, both from the very small quantity of tea which 2 ounces a week, when used twice or thrice a day, can afford, and from the inferior quality of tea which is obtained by them in villages; 3rd, from the fact that it is never drank cold when it can be obtained hot. Hence it is easy to account for its universal use, and particularly in the poorest dietaries; but when the infinitesimal nutriment which is contained in 1 oz. of tea, costing *3d.*, is compared with that in 12 pints of skimmed milk, costing in Devon the same money, it is matter of regret that the latter should not be more generally attainable, and be universally used by the poor.

More by wife and children than husband.

Quantity extreme.

Uniform.

Reason for use of tea.

Great cost.

12 pints of skimmed milk contain 5,238 grains of carbon and 523 grains of nitrogen.

1 oz. of tea contains scarcely any carbon and only 10 grains of nitrogen.

Relative nutritive value of milk and tea.

It was remarked by Case No. 133. that so much tea made her thin.

Beer is given as a part of the wages almost universally for 2 or 3 months in the summer season, and in certain counties or parts of counties, as Lincoln and Stafford, it is allowed during the whole year, or 1*s.* a week is allowed instead of beer, as in Essex; but when regarded on a large scale, I am struck with the small quantity of this fluid which

BEER.

enters the labourer's cottage. In 26 per cent. of the cases some quantity of ordinary beer, and in 8 per cent. a weak beer, was drank, exclusive of an occasional pint obtained by the labourer in return for extra work, or drank on Saturdays at the public house. The enquiry is not one which can be made with the utmost accuracy as respects the labourer himself, since, although he may not have it regularly, he obtains a little occasionally, and in the cases in which he drinks much comparatively neither he nor his wife will state the quantity. Hence, whilst making every effort to obtain correct results, I have not attached great value to this subject; but, so far as relates to the use of beer by the family at home, it is almost infinitesimally small.

I found certain villages with an unenviable reputation in reference to sobriety, but their number was insignificant, and even there it was the few, and not the many, which gave cause for the imputation. There can be no doubt that the habits of the farm labourers in this respect have greatly improved during the last few years.

Cider was generally given as a part of the wages in Cornwall, Devon, Somerset, and part of Dorset; but there were instances in which higher wages, and no allowances, were preferred. The minimum and usual quantity was 2 pints a day, which was valued at 1*d.* per pint, but sometimes it was increased to 3 pints or to 4 pints for extra services, and in summer time was 4 pints and upwards daily.

Very large quantity of fluid drank.

The labourer received this, and carried it in a small wooden cask to his work; and although I enquired very generally I found but exceedingly few cases in which any was brought home for the use of the wife and family. Perhaps there are but few subjects more striking in a physiological point of view than the very large quantity of cider (as also of weak beer) which is drunk in the harvest season. One gallon per day is the usual allowance; but as there is not practically any limitation I found many who drank two gallons and upwards daily, under these circumstances. The effect of so large a quantity of fluid passing through the blood must be great, whatever may be the nature of the fluid, but I did not hear of any evils which were traced to it.

Such is a bird's-eye view of the dietary of the farm labourers throughout England. I shall now briefly state the arrangement of the foods in the meals, and as in doing so I shall exhibit one of the conditions of the home life of the largest section of a nation, I think it may warrant me in citing a few examples from nearly every county.

MEALS.

In reference to the meals of labourers in farmhouses I have only a few illustrations, but some of them are sufficiently striking.

At farmhouses. In Devon.

Devon, Yealmpton. Chiefly for persons from 15 to 18 years of age. *Breakfast and Supper*:—Bread and milk, or bread and clotted cream, followed by fried potatoes and boiled milk and plum pudding, or bread, cheese, and cider, or cold meat 4 or 5 times a week. *Dinner*:—Always hot meat (mutton, pork, or bacon), with vegetables and bread, and milk and flour pudding (suet is never used).

The meat is sometimes baked over the potatoes. The pudding is cooked only at dinner time, when it is eaten hot, and the remains of it are eaten cold at the other meals. About 8 oz. of it are eaten at each meal. 1½ pint of cider is drunk at these meals. The farmer estimated that each person ate 1½ to 2 lbs. of raw meat, 1 lb. of flour, 5 oz. of bread, and 1¼ pint of skimmed milk, besides other food, daily.

Salop.

Salop, near Oswestry. A majority of the labourers take food at the farmers. *Breakfast* (7 a.m.):—Broth, made from meat liquor, oatmeal, and vegetables, and bread, cheese, and beer, or cold or hot milk, according to the season. *Lunch* (10 a.m.):—Bread, cheese, and beer.

Dinner 1 (p.m.) :—Boiled meat and bacon, with vegetables, bread, and beer daily, and dumplings, or pudding, twice or thrice a week. *Supper* 7 (p.m.) :—Same as the breakfast, or toasted bread and milk, or meat pie.

Notts, Wilford. Only young men live at the farmers' houses. *Breakfast* (6 to 7 a.m.) :—Bread and boiled milk (no oatmeal), followed by cold boiled bacon and bread. *Lunch* (10½ a.m.) :—Bread and cheese eaten in the field. *Dinner* (3 p.m.) :—On Sunday, hot roast beef and Yorkshire pudding, with vegetables and bread. On other days broth, then pudding, and lastly meat of various kinds, hot and cold, alternately, with vegetables and bread and ale. *Supper* at 7 p.m. :—Bread and cold bacon. The farmer estimated that each man ate daily ¼ of a pint of milk, 1lb. of uncooked meat, ¼lb. of bacon, and a pint of ale, besides bread, flour, and vegetables and cheese.

Derbyshire, Sawley. *Breakfast* :—Milk, hot in winter and cold in summer, followed by cold bacon or meat, or bread and cheese. *Dinner* :—Butchers' meat five days in the week. Broth when there is hot meat, and pudding when the meat is cold, vegetables and bread. On two days bacon, with vegetables and pudding ; beer, worth ½*d.* per pint. *Supper* :—New milk, with bacon or meat which has been left from dinner, and bread or bread and cheese. Notts. Derby.

Cheshire, Macclesfield Forest. *Breakfast*:—Milk porridge and bread, with coffee, tea, and bread, butter or cheese. *Dinner* :—Suet or preserve dumpling or pudding, meat and potatoes, daily. *Tea* :—Bread, butter, or cheese. *Supper* :—New milk, bread and cheese, or a little cold meat. Cheshire.

Northumberland, Haydon Bridge. *Breakfast* :—Hot milk, porridge with oatmeal, followed by bread and cheese. *Dinner* :—Meat, vegetables, pudding, and bread, daily. *Supper* (6 p.m.) :—Cold bread and milk, and cheese. Northumberland.

Cumberland. *Breakfast'* (6¾ a.m.) :—Boiled milk and oatmeal followed by bread, cheese, and cold milk. *Lunch* (10 a.m.) :—Bread and milk, or bread and cheese. *Dinner* (12½ p.m.) :—Butchers' meat (bacon rarely), with vegetables and pudding, and broth with hot meat. In some places weak beer is allowed. *Tea* (4½ p.m.) :—Tea, bread and butter. *Supper* (7 to 8 p.m.) :—Broth, cold milk and bread, and cheese, preceded or not by boiled milk and oatmeal. Each man takes about four pints of milk, 1½lb. of cooked meat, and 2lbs. of bread daily. Cumberland.

Yorkshire, Lepton. *Breakfast* :—Boiled skimmed milk and oatmeal, with bread and cheese. *Dinner* :—Hot or cold meat daily, with potatoes, bread and cheese and beer. *Tea* :—Tea, bread and dripping, with butter on Sundays. *Supper* :—Bread, cheese, and beer, or milk porridge. York.

Swinton near Malton. *Breakfast and Supper* :—Beef or bacon pies, with milk and bread. *Dinner* :—Beef, bacon, and vegetables, broth on two or three days, meat pies, and milk twice a week. The meat boiled and roasted alternately. No beer is given. The estimated quantity of meat eaten thrice a day was 1 lb. a head.

Buckton near Burlington. *Breakfast and Supper* :—Cold meat and bacon, or cold meat pie, cheesecakes, or custard puddings, milk and bread. *Dinner* :—Hot boiled meat and broth three days, hot meat pies four days, with vegetables, fruit pies, or milk pudding and bread. Beer at discretion, costing ½*d.* per pint.

Speeton. Meat thrice a day. *Dinner* :—A basin of bread and milk, followed by dumpling, and beef and bacon, with vegetables and beer, and ending with bread and butter.

Near Beverley. *Breakfast and Supper* :—Cold beef and bacon, and beer, fruit pies, milk. *Dinner* :—Hot meat pies, with fruit pies or

pudding, bread and vegetables. Each man eats daily about 1 lb. of cooked meat, 2lbs. of bread, 2 pints of milk, and 2 pints of weak beer.

Thorpe Hall near Howden. *Breakfast and Supper :*—Cold meat and bacon, rhubarb tarts and treacle, with milk and bread. *Dinner :*—Hot beef and bacon, with vegetables on Sundays, and fruit or treacle pudding. Three or four days cold meat, with vegetables, dumpling, dripping, and bread. Two days, meat pie with pudding. One day hot boiled bacon. The men do not like broth. They eat daily, per head, 2lbs. of flour, 1lb. of potatoes, 1 oz. of butter or lard, 1lb. of meat and bacon, and 4 pints of skimmed milk. Ale is given only with particular kinds of work.

Hence in various parts of England there are usually four meals daily. Meat and bacon are supplied once a day universally, and in many three times a day. Vegetables always accompany the dinner, and puddings or pies are supplied thrice a day in Devon, and usually daily elsewhere. Milk is eaten twice a day. Broth is eaten with breakfast in a few places, and with dinner when there is hot meat. In some parts of the north tea and butter are given. Weak beer, and in some places strong ale, and in others cyder is generally given once a day or oftener. All the foods are eaten in an unlimited quantity; and although it has been proved by the farmers that when there is always an abundant supply the total consumption is rather decreased than increased, there is evidence to show that no class of men could be more abundantly fed. It seems absurd to find in Yorkshire that cheesecakes and custards are given almost daily at breakfast and dinner, and that the men take a nap for an hour after dinner, as at Mr. Thompson's of Backton. So well fed are they that they object to mutton because it is fat, and when supplied they will cut off the fat and throw it under the table.

There is a singular system in operation in Hants, by which a boy of 14 or 16 years of age living in a farmhouse does not have food provided for him by the farmer, but has a certain sum allowed him weekly for food, which he spends as he pleases, and cooks his food where he can obtain permission. Such a case is No. 375.

The meals at the labourers' houses will be found to differ greatly from the foregoing.

Meals, labourers houses.

Cornwall.—Case No. 130. Either hot dinner or hot supper, as the husband is at home, consisting of meat with vegetables, or hot pie or meat pudding. Broth is not used. White pot (flour boiled in milk) is used for breakfast.

In Devon.

Devon.—Case 135. *Breakfast and Supper :*—Tea-kettle broth (bread, hot water, salt, and $\frac{1}{2}$ pint of milk), bread and treacle. *Dinner :*—Pudding, (flour, salt, and water), vegetables and fresh meat. No bread. Case 137. *Breakfast :*—Tea-kettle broth, and the wife takes tea and fish. *Dinner :*—Husband, bacon pudding; tea, bread and butter, or treacle, for the other members. *Supper :*—Cocoa and bread, or boiled cabbage and pudding for the husband; tea, bread, butter, or treacle for others. Case 139. and 140., bread, butter, or treacle, and tea. *Dinner* the same, but for husband meat, pudding, and potatoes. *Supper :*—Tea, fish, or bacon. Case 143. *Breakfast :*—Tea-kettle broth or milk porridge. *Dinner :*—All have a little meat, vegetables. *Supper* as breakfast, or stewed rice. Case 146. (best arrangement). *Breakfast :*—Fried bacon, and cabbage with it, if any, but otherwise, the bacon fat saves bread. *Dinner :*—A little boiled meat, broth, cabbage, suet pudding, boiled in the broth. *Supper :*—Tea, bread, and butter, and anything left from the dinner. Case 147. *Breakfast :*—Some have rasher of bacon, and bread; others, bread, and butter, or treacle, also tea.

Dinner:—the same. *Supper*:—Bacon, baked with potatoes, boiled cabbage, also tea. Case 140. *Breakfast*:—Husband, tea, rasher of bacon, bread, or milk broth; family have tea, bread, or milk broth. *Dinner*:—Husband, meat or bacon, pudding or pastry, eaten cold; family, broth, bread, or tea, rasher of bacon, and bread. *Supper*:—Tea, or milk and water; cabbage is fried at supper or dinner, as either as the hot meal.

Case 153. *Breakfast*:—Husband has bacon and tea; wife, dry bread and tea; children, milk. *Dinner*:—Husband, bacon and tea; family, tea, bread, and treacle. *Supper*:—Hot baked bacon and potatoes, boiled greens, or baked suet pudding, or stewed rice. The children have milk broth. Case No. 155. *Breakfast*:—Husband takes bread and butter with him; wife has tea and bread, or bread and butter. *Dinner*:—Broth, meat and vegetables daily. *Supper*:—Tea, fried vegetables and perhaps meat. Case No. 159. *Breakfast*:—Sop (same as tea-kettle broth) and bread; wife has tea. *Dinner*:—Broth (made from bacon), and bread or fried bacon with potatoes. *Supper*:—Bread and milk, or tea or sop. Case No. 163. *Breakfast*:—Wife has tea, bread and butter; husband, tea-kettle broth, with dripping or butter added, and with or without milk, also bread, butter, treacle, or cheese. *Dinner*:—Fried bacon and vegetables, or bacon pie, with potatoes and bread. *Supper*:—Tea, or milk and water, with bread, cheese, and butter. Case No. 164. *Breakfast*:—Broth (dripping, bread, hot water, milk, salt, and pepper), bread, bacon, or butter. Children have bread and milk. *Dinner*:—Baked potatoes and bacon, vegetables, boiled or baked pudding, with flour and fat, bread. *Supper*:—Herrings and what is left from dinner.

Somerset. (Case 168.) *Breakfast*:—Broth (bacon liquor, or bacon dripping, bread, pepper, and salt), or rasher of bacon, and tea. *Dinner*:—Potatoes and bacon, or dripping, bread, and cheese. *Supper*:—Bread and cheese. Case 169. Bread, butter, or cheese, and tea at all meals, with a little bacon at tea. Case No. 171. *Breakfast*:—Bread broth (water, milk, or cream, bread, salt, and pepper); husband has bread and butter. *Dinner*:—Boiled rice, with salt or sugar. *Supper*:—Tea, bread, butter, or treacle. Case No. 172. (unhealthy.) *Breakfast*:—Bread broth for the little children. *Dinner*:—Bread and little bacon. *Supper*:—The same, if any left. Case No. 174. *Breakfast*:—Tea and bread. *Dinner*:—Vegetables and bacon, one half the week, and vegetables alone the other half. *Tea*:—Tea and vegetables. Case No. 175. Hot dinner, with potatoes and bacon daily, and sometimes hot suppers. Case No. 183. Sometimes hot dinner, and always hot supper, with a little meal daily, and leave enough for the following breakfast. Case 188. *Breakfast and Dinner*:—Tea and bread; children have water broth, and husband takes bacon with him to his work. *Tea or Supper*:—Boiled rice and crumbs of bread, with dripping. Somerset.

Dorset. (Case No. 191.) *Breakfast*:—Water broth, bread, butter, tea, and milk. *Dinner*:—Husband has bread and cheese; family take tea besides. *Supper*:—Hot fried bacon and cabbage, or bread and cheese. Case 193. *Breakfast and Dinner*:—Sop for infant, dry bread for family, and bread and cheese for husband. *Supper*:—Hot fried bacon and cabbage. Case No. 194. *Breakfast*:—Water and milk broth for children, bread for the others. *Dinner*:—Boiled rice, or bread and bacon. *Supper*:—Broth, bread, and tea. Case No. 196. *Breakfast and Dinner*:—All have bread and cheese. *Supper*:—Fried bacon, with bread or cabbage, and cocoa. (Cases Nos. 197, 198, 199). Bread and cheese for the husband, and tea, bread and butter, for the others, at all the meals; bacon once or twice a week. (Case No. 200) (the best Dorset.

here). Bread and cheese at all meals, and hot supper or hot dinner three or four times a week, with bread, bacon, and vegetables.

Wilts. (Case No. 211.) *Breakfast :*—Water broth, bread and butter. *Dinner :*—Husband and children have bacon (sometimes), cabbage, bread and butter ; wife has tea. *Supper :*—Potatoes or rice. Case 212. *Breakfast :*—Sop, bread, and sometimes butter. *Dinner :*—Bread and cheese. *Supper :*—Onions, bread, butter, or cheese. Case 216. *Breakfast :*—Husband and children milk and bread ; others bread, butter, and tea. *Dinner :*—Bacon, vegetables, bread, tea. *Supper :*—Tea, bread, and butter. (Case No. 219.) *Breakfast :*—Husband, bacon and bread ; others, milk broth and bread. *Dinner :*—Cabbage, bread, and treacle. *Supper :*—Cabbage and bacon and bread, if the husband did not go home for dinner.

Wilts.

Gloucester. Hot supper :—Potatoes or boiled cabbage ; sometimes bacon ; pudding only on Sunday.

Gloucester.

Worcester. (Case No. 240.) *Breakfast* 8 A.M. :—Tea, bread, and butter, and sometimes bacon. *Dinner* 1 P.M. :—Bacon and vegetables ; pudding on Sunday. *Tea* 6 P.M. :—Bread, butter, cheese, or bacon, when not hot dinner.

Worcester.

Lincoln. (Case 248.) *Breakfast :*—Milk gruel, or bread and water, or tea and bread. *Dinner :*—Meat for husband only ; others vegetables only. *Tea and Supper :*—Bread or potatoes.

Lincoln.

Notts. (Case No. 255.) Children, thickened milk ; others, tea or coffee and bread and butter, with cheese sometimes. *Dinner :*—Little meat and potatoes. *Supper :*—Bacon or tea.

Notts.

Cheshire. (Case No. 271.) *Breakfast*, 5½ A.M. and 8 A.M. :—Tea, bread, and butter. *Dinner :*—Bacon, potatoes, and whey. *Tea :*—Tea, bread, and butter. *Supper :*—Bacon and potatoes. (Case No. 272.) *Breakfast :*—Coffee, bread, and butter. *Dinner :*—Meat or bacon and potatoes, pudding on Sundays. *Tea :*—Tea, bread, and butter. *Supper :*—Rarely.

Cheshire.

Derbyshire. (Case No. 281.) *Breakfast :*—Coffee, bread, and butter. *Dinner :*—Hot meat, vegetables, and pudding daily. *Tea :*—Tea, bread, and butter. *Supper :*—Hot, when not hot dinner.

Derby.

Northumberland. (Case No. 288.) *Breakfast* 4 A.M. :—Husband, milk and bread ; 8 A.M. family, coffee, bread, and butter. *Dinner* 12 :—Meat, potatoes, and pudding daily. *Tea* 6 :—Tea, bread, and butter. *Supper* 8 :—A little milk sometimes.

Northumberland.

Durham. (Case No. 291.) *Breakfast* 8 A.M. :—Tea or coffee, bread and butter. *Dinner* 12 :—When hot, it is meat and vegetables ; when cold, it is tea, bread, and lard. *Tea* 6 :—Tea, bread, and milk. *Supper* 9 :—fried potatoes and bacon sometimes.

Durham.

Westmoreland. (Case No. 294.) *Breakfast :*—Tea, bread, and butter, porridge and milk for the children. *Dinner :*—Meat and potatoes. *Tea :*—Tea or rice milk. *Supper :*—Porridge or rice milk.

Westmoreland.

Cumberland. (Case No. 301.) *Breakfast :*—Husband, oatmeal and milk porridge ; the others tea, bread, butter, and cheese. *Dinner :*—Meat and potatoes daily, bread, cheese, and milk. *Supper :*—Boiled milk followed by tea, bread, butter, and cheese.

Cumberland.

Lancashire. (Case No. 304.) *Breakfast :*—Milk porridge, coffee, bread, and butter. *Dinner :*—Meat and potatoes, or meat pie, rice pudding, or a baked pudding ; the husband takes ale, bread and cheese. *Supper :*—Tea, toasted cheese, and bacon instead of butter.

Lancashire.

Staffordshire. (Case No. 309.) *Breakfast :*—Coffee and bread, or bread, butter, or sugar. *Dinner :*—Little meat or bacon daily, and chiefly for husband, vegetables and bread. *Tea :*—Tea, bread, and butter.

Staffordshire.

Warwickshire. (Case No. 325.) *Breakfast* 5 A.M. :—Husband, tea, bread, and milk ;—8 A.M. husband, bread, meat, or cheese, and coffee ; family, tea, bread, and butter, or milk. *Dinner :*—Husband, meat, of bacon daily, but hot only on Sunday ; the others, bread and cheese, butter or treacle. *Supper :*—Hot meat or bacon, and cabbage, rice or suet pudding.

Northampton. (Case No. 325.) *Breakfast :*—Tea, bread, and butter. *Dinner :*—Meat, vegetables, and flour or suet pudding. *Tea :*—Tea, bread, and butter. *Supper :*—Bread and meat. (Case 228.) Husband has meat daily, but family only four times a week.

Suffolk. (Case No. 342.) *Breakfast :*—Tea and bread. Children have water broth. *Dinner :*—Potatoes and dripping and tea. *Supper :*—Pudding (water and flour), hot potatoes, and tea. Husband eats the bacon.

Kent. (Case No. 356.) *Breakfast :*—Tea, bread, butter, or cheese. *Dinner :*—Meat, pudding, and vegetables. *Supper :*—Tea, bread, butter, and cheese ; sometimes bacon on Saturday night.

Sussex. (Case No. 358.) *Breakfast :*—Tea, bread, butter, or cheese. *Dinner :*—Little meat, vegetables, cheese or butter, and bread daily, but they cook only once or twice a week. *Supper :*—Bread and butter.

Surrey. For dinner, meat or plain flour pudding.

Hants. (Case No. 374.) Husband has all the bacon. Tea is taken twice a day. Supper is hot with cabbage and bacon or flour pudding.

Warwickshire, Northampton, Suffolk, Kent, Sussex, Surrey, Hants.

Oxfordshire. (Case No. 388.) *Breakfast :*—Tea, bread, butter, and dripping. *Dinner :*—Bacon three days per week, vegetables, and bread ; other days vegetables, bread, and tea. *Tea and Supper :*—Bread and tea (Case No. 387.) *Breakfast :*—Coffee, bread, and butter, and husband has bacon. *Dinner :*—Boiled bacon with vegetables ; pudding twice a week. *Tea :*—Tea, bread, and butter. (Case No. 384.) *Breakfast :*—Tea, bread, butter, or treacle. *Dinner :*—Bread and cheese for husband and children ; the others have bread, cheese, and tea, or potatoes and herring.

Oxfordshire.

Tea and Supper :—Hot bacon and vegetables.

Herts. (Case No. 404.) *Breakfast :*—Husband, pork and bread, perhaps beer ; family, tea or milk, bread and butter. *Dinner :*—Husband, meat and bread ; family, tea and vegetables, perhaps meat. *Supper :*—Bread and cheese, sometimes vegetables and meat. (Case No. 405.) *Breakfast :*—Tea, bread, and butter. *Dinner :*—Husband, pork and bread ; family, tea, bread, and butter. *Supper :*—Various.

Herts.

Hunts. (Case No. 416.) *Breakfast :*—Tea, bread, and butter. *Dinner :*—Men, meat, vegetables, and tea ; family, tea, pudding, and eggs, perhaps meat. *Supper :*—Twice a week when they had not had dinner, pudding, meat, and vegetables. (Case No. 423.) *Breakfast :*—Children bread and butter and sop (bread, sugar, and water). *Dinner :*—Meat pudding. *Tea :*—Children have tea, bread, and butter. *Supper :*—Husband only, hot meat and potatoes.

Hunts.

Cambridgeshire. (Case No. 426.) *Breakfast :*—Pork, tea, bread, and butter. *Dinner :*—Meat, vegetables, and pudding almost daily. *Tea :*—bread and butter. *Supper :*—Very rarely. (Case No. 429.) *Breakfast :*—Parents, tea or coffee, bread and butter ; children, gruel (water, flour, butter, salt, and pepper), or sop (bread, butter, water, salt, and pepper). *Dinner :*—Pudding (flour and water), pork, and hot potatoes. *Tea :*—Bread, butter, and tea. *Supper :*—Very rarely. (Case No. 432.) *Breakfast :*—Husband takes to his work a mess (bread, water, butter, pepper, and salt) ; boy at work has milk, bread, and butter ; the others tea, coffee, and bread. *Dinner :*—Husband, meat

Cambridgeshire.

pudding, with onions, the others dumplings (flour, yeast, water, and salt). *Tea:* Tea, bread and butter, potatoes, or a mess.

Beds. (Case No. 445). *Breakfast:*—Tea, coffee, and bread, or bread and butter. *Dinner:*—Boiled pork four days weekly and vegetables. *Tea:*—Tea or coffee, bread and butter. *Supper:*—Bread. (Case No. 446.) *Breakfast:*—Coffee, bread, and butter, and husband has meat also. *Dinner:*—Hot meat and pudding with vegetables. *Tea:*—Tea, bread, and butter. *Supper:*—Bread and butter.

Rutland. (Case No. 453.) *Breakfast:*—Coffee, bread, and dripping. *Dinner:*—Broth and vegetables, and the wife has tea. *Tea:*—Tea, bread, and dripping.

Yorkshire. (Case, No. 458.) *Breakfast:*—Tea or coffee, milk, bread, butter, or treacle. *Dinner:*—Meat, potatoes, and bread. *Tea:*—Tea, bread, and butter. (Case No. 471.) *Breakfast:*—Husband, milk and bread; family, tea, bread, and butter. *Dinner:*—Husband, bacon daily; others three days weekly, potatoes or bread, tea. *Tea:*—Tea, bread and butter.

Beds.
Rutland.
Yorkshire.

VALUE OF THE FOODS.

Average amount.

The value of the foods which have now been described was upon the total average 2*s.* 11½*d.* per adult, or 13*s.* 7½*d.* per family weekly. In this sum is included the value of every article of food in the localities referred to, including that of vegetables, beer, and cider, which may not cost the labourer any money, but result from his labour, and is therefore a part of his daily income. This plan was necessary, both to show upon how much the labourer actually lives, and to enable me to compare the value of the food obtained by persons living when such advantages as gardens and allowances do not exist. There was considerable variation in the average value of the food in the different counties, because the quantity of food, and its local value, varied, and, as will be shown presently, the economy with which the money was spent varied much also. Thus in six counties, Northumberland, Durham, Lancashire, Warwickshire, Kent, and Surrey, the value exceeded 4*s.* per adult. In four counties, Cheshire, Westmoreland, Cumberland, and Northampton, it was from 3*s.* 6*d.* to 4*s.* In 13 counties (nearly one third), Worcester, Salop, Lincoln, Notts, Leicester, Derby, Suffolk, Sussex, Oxford, Bucks, Herts, Huntingdon, and Rutland, it varied from 3*s.* to 3*s.* 6*d.* In Norfolk it was so low as 2*s.* 0½*d.*, and in Devon 2*s.* 4¾*d.* per adult. In Wilts, Essex, and Hants it was between 2*s.* 6*d.* and 2*s.* 9*d.* per adult; and in 13 counties (nearly one third), Cornwall, Devon, Somerset, Dorset, Wilts, Gloucester, Warwick, Norfolk, Essex, Hants, Berks, Cambridge, and Beds, it was below the average of the whole country. The extremes were in Northumberland and Norfolk, and the former was more than double the latter.

Variation in counties.

ECONOMY IN PURCHASING FOOD.

The economy with which the money was spent is tested by the amount of nutriment obtained for a given sum, and varies in families and counties as the prices of foods vary, and as those foods are selected which give the largest amount of nutriment for the money. The former have influence when country and town districts are compared, for the cost of almost every article (excepting vegetables and milk), in relation to its quality, is greater in the former than in the latter; but it is to the latter that we must look for the chief cause of variation.

Average quantity for 1*s.* Variations. Carbon.

On the total average of the farm labourers of England, 12,398 grains of carbon and 495 grains of nitrogen were obtained for 1*s.*; and it is very curious and instructive to note in the tables the several places in which there were wide variations from it. Thus the amount of carbon was below 8,000 grains in Warwickshire, 9,000 to 10,000 in Lancashire, and 10,000 to 11,000 grains in Cheshire, Durham, Kent, and

Surrey, whilst in nearly half (46 per cent.) of the counties, Cornwall, Lincolnshire, Leicester, Cheshire, Derbyshire, Northumberland, Durham, Cumberland, Lancashire, Staffordshire, Warwickshire, Northamptonshire, Kent, Surrey, Oxford, Herts, and Hunts, it was below the total average. In reference to nitrogen the least quantity obtained for 1*s.* was 364 grains in Warwick (the county lowest in the quantity of carbon obtained for 1*s.*), was less than 400 grains in Cheshire, Lancashire, Warwickshire, Kent, and Surrey, and was below the average of all England in 54 per cent. of the counties, Cornwall, Somerset, Notts, Cheshire, Derbyshire, Northumberland, Durham, Cumberland, Lancashire, Staffordshire, Warwickshire, Northamptonshire, Kent, Surrey, Hants, Oxford, Berks, Bucks, Hunts, and Rutland.

There is therefore a substantial agreement between the counties which were below the average in both carbon and nitrogen, but there are a few anomalies. Thus Lincolnshire and Leicestershire were below in carbon but not in nitrogen, whilst Somerset, Notts, Hants, Berks, Bucks, and Rutland were below the average in nitrogen. It is further to be remarked, that the poor counties do not appear in the list referring to carbon, and many are omitted, whilst several are included in that referring to nitrogen. Hence in general terms the least economy of food is not found in the poorest counties.

On the other hand, there were counties in which the economy in both carbon and nitrogen was conspicuous. Thus in Devon, Gloucestershire, Salop, Norfolk, and Essex the quantity of carbon exceeded 14,000 grs. for 1*s.*, whilst, besides these counties, the quantity exceeded the average in Somerset, Dorset, Wilts, Worcestershire, Notts, Cumberland, Suffolk, Sussex, Hants, Berks, Bucks, Cambridgeshire, Beds, and Yorkshire. In reference to nitrogen, the largest amount obtained for 1*s.* was in Norfolk, where it reached ½ more than the average, viz., 747 grains and from 600 to 700 grains was obtained in Devon and Gloucestershire. The counties in which the amount was above the average in economy were Norfolk, Devon, Gloucester, Dorset, Wilts, Worcester, Salop, Lincoln, Leicester, Westmoreland, Suffolk, Essex, Sussex, Herts, Beds, and Yorkshire.

I will now offer a few observations in the nature of conclusions :—

CONCLUSIONS.

1. The agricultural labourers of England, apart from their families, regarded in a general manner as a class, are not ill fed, and their known longevity, with the favourable rate of sickness, as shown by the returns of benefit societies, can only be supported on that conclusion. Well-fed.

2. Those living in farmhouses are most abundantly fed, and are amongst the best nourished populations in the kingdom. The testimony of those competent to judge goes to prove, that with this good feeding there is proportionate strength to work, and that, when the will is joined to the strength, they can perform much more labour than others who are less fully fed. Relative amount of food and strength.

3. The class of farm labourers families is a very mixed one, since in counties where sufficiency is the rule deficiency is found side by side with it, and vice versâ, in the poorer counties. Mixed class.

4. There is no county where the average dietary is so low as that of the town populations included in this report, or so low as that considered by me to be necessary for the Lancashire operatives, when an equal number of the sexes is considered, with the exception of Somerset, Oxford, and Berks in the quantity of nitrogen. Comparison with town populations.

5. The nourishment obtained by the labourer himself is larger than the average quantity indicates, since he eats a larger share of the food than other members of the family, (including in the Relative nourishment of labourer and his family.

poorer districts nearly all the meat and bacon,) and in certain districts has beer or cider, the nutritive value of which is not calculated in the dietary.

6. There is reason to believe that the quantity of food obtained by the wife, and also by the children at the period of rapid growth, is in many cases, in almost every county, deficient, and particularly in nitrogen.

7. Those families are in the most straitened circumstances, cæteris paribus, 1st, who have several children under the age of 10 years, and therefore too young to earn anything; 2d, who reside in localities where labour for the wife and female members of the family is deficient or unremunerative; 3d, who occupy high rented houses; 4th, who are not able to grow vegetables in abundance; 5th, who do not live within easy distance of a moderately large town, where they might purchase their goods.

Defect of food for wife and children.

Causes of general defect of food.

Out-door labour of women.

8. The labour of women in the fields (whatever may be its disadvantages, and however desirable it may be that it should not be necessary,) is under present circumstances of great advantage to the family, since it adds that amount of income to the family which relieves from the pressure of want, and provides shoes and clothing, and pays the rent, and thus enables the whole family to be better fed; at the same time, the exertion in the open air, and oftentimes the good food at the farmhouse, improves the health of the wife, and is not generally (remembering the pecuniary necessity for it) distasteful to her, and when she can find employment the children can obtain employment also, and thus further add to the income of the family. When the income attainable by the husband is sufficient to maintain his family in health and respectability, no doubt the out-of-door occupation of the wife and young children should cease, so as to give better opportunity for cooking and the increase of domestic comfort, and to enable the children to obtain a better education; but the first question at present is, the obtainment by any means of sufficient money to maintain her family. When the husband is temporarily or permanently unable to work the labour of the wife is necessary, and I found many widows maintaining themselves and their orphan children in a respectable manner by husbandry.

Kind of dwellings required.

9. A most desirable object for the benefit of this class is the opportunity of obtaining houses at a rent not exceeding 1*s.* per week. The tables will show that at present the average rent is between 1*s.* 6*d.* and 2*s.* per week. In reference to accommodation care should be taken that the desired object is attainable, and that sentiment should not so largely enter into it as to prevent practical effort being made, and so as to lay a burden upon the labourer. What is required is a house which is wind and water proof, dry, and in general healthy. It is not required that it shall be even good looking, much less that it shall be architecturally ornamental. A thatched substantially built and moderately large house is quite as fitted for the purpose as any other. It must be borne in mind that houses do exist, and represent property and income to some one, and that so long as they fulfil the above conditions it would be neither economical nor necessary that they should give place to others. To improve the present houses where practicable, and when new ones are built to improve upon the old ones, are the only available methods.

In various parts of the country I noticed most wretched houses, as near to Croydon in Surrey, in Sussex, in Berks, in Bucks, in Hants, at Stratfield Turgis near to Basing, in Oxfordshire, at Stoneleigh, in Cornwall, in Somerset, and in the fens of Cambridgeshire, and as some of these belong to noblemen and families of wealth it is the more to be regretted. On Dartmoor I found many houses with the ground for the floor, and in other parts of Devon a thin dark coloured stone placed edgewise, leaving the dirt and water to accumulate, and giving an air of discomfort greater than that of a stable, where such paving is more generally seen. On the other hand, a majority of houses exist which fulful the conditions above laid down, and all over the country there are efforts made to improve the habitations, and particularly on the large estates of the nobility and gentry. Of these which came under my notice I would mention those of the Duke of Bedford at Tavistock, and in Dorset, Lord Overstone in Berks and Northampton, Lord Clinton in Devon, Mrs. Dudway, at Duleott, near to Wells, Mr. Everett at Sutton, the Marquis of Bath in Wilts, the Earl Brownlow in Lincolnshire, Lord Londesborough in Westmoreland, the Earl of Aylesford and Lord Leigh in Warwickshire, Colonel Lowther in Rutland, Lord Carrington in Beds.

Wretched houses.

Good houses.

But the essential part of the question now is the rent which is charged for these houses. Thus whilst at Tavistock the Duke of Bedford charged *6s. 9d.* a quarter or *6d.* a week, and at Merton Lord Clinton charged *1s.* a week for very good modern houses, *2s.* a week was charged at Dulcott, near to Wells, with their ornamented roofs, varnished doors and windows, and lofty rooms. The income of the labourer, in the first place was *12s.*, in the second *10s.*, and in the third *9s.*; an order the inverse of that of rent; so that the latter class of houses (when the only ones attainable by the labourers) are most disadvantageous.

Rent.

10. In reference to foods it has been shown:—

1. That it is most important to the labourer to be able to grow a large quantity of potatoes and other fresh vegetables, and thus to convert his spare time into money directly, by supplying food, and indirectly by feeding a pig, and avoiding the necessity for more costly food.

Grow vegetables.

2. That good and cheap bread is everywhere obtained, and that white bread is universally preferred. Barley and rye constitute no noticeable part of the dietary in England.

Cheap bread.

3. Sugar, separated fats, meat, and milk are almost universally obtained. Treacle is not so much used as sugar. Butter is the favourite fat, and bacon and pork are the most frequently selected of meats. Cheese is largely eaten in a very small minority of the counties. Tea is universally drank, whilst coffee is much less frequently selected. Beer is most rarely drank by the labourer's family, and but sparingly by himself.

Various foods.

11. It is of the greatest importance that milk, in one of the forms of new milk, skimmed milk, or butter milk, should be more universally attainable, and that the health of the working man should not be thought of less consequence than the welfare of calves, pigs, and hounds. The sale of milk is practically a monopoly, since the poor cannot procure it for themselves,

Require more milk.

neither can they go to places distant from their own village to buy it. Hence a deep moral responsibility rests upon the farmers who have it, and refuse to sell it to the poor.

12. The condition of this class in winter is more unfavourable than at other seasons, since the husband is more frequently unemployed, and the wife and children cannot work out of doors, and at the same time there are extra expenses, for firing is more expensive, clothing more necessary, and the health suffers, from the great pest of the farm labourer—rheumatism. Hence they usually have less food in winter, at the season when they need more food. Within limits, certainty and regularity of income are more important than the amount.

Comfort varies with the seasons.

13. It is very desirable that the wages of the labourer should be paid weekly. In certain districts the payment is fortnightly, and in others, as at Horningsham in Wilts, and in Northumberland, it takes place monthly. With long intervals of payment the labourer must obtain goods on credit, and thus be likely to gain a thriftless habit. He pays higher prices, and is practically restricted to the shop which gives him credit. At Horningsham, flour cost 2*s.* 4*d.* per stone, whilst it was 1*s.* 10*d.* per stone elsewhere.

Evil of monthly payment of wages.

And in buying food cheaply.

14. An extension of the plan in operation at Rothampstead under the patronage of Mr. Lawes, whereby labourers obtain certain articles of food at cost price, and have the use of a reading room, &c., at a very small cost is most desirable; as also the general introduction of American bacon and skimmed-milk cheese, low priced rice and treacle, and other cheap yet good foods, at the lowest price, into villages, should be encouraged. When buying foods in small quantities the cost is always greater. The more extensive use of woollen clothing amongst labourers and their families is highly desirable; for in the end it is cheaper, in the use is warmer, and at all times looks better than faded and worn cottons.

Cooking.

15. It is desirable that the labourers' families should be better informed as to the necessity for hot food and daily cooking, also of the most economical and yet practicable dishes, and especially of the folly of buying the expensive kind of bacon, cheese, and butter, when the cheaper forms would enable them to purchase a larger quantity of them.

Allowance of beer and cider not economical.

16. The habit of giving beer and cider as allowances instead of money is disadvantageous to the poor, since they are not necessary, and therefore are dear foods.

Improvement of condition.

17. It may not be doubted that the condition of the farm labourer and his family has much improved of late years, in his wages, the lower price of provisions, and the work which the extension of trade and communication now offers to him and his family.

Give used tea leaves.

18. With the universal desire for tea, and considering its cost, it is desirable that the better classes in each neighbourhood should give the used tea and coffee to such as would desire to have them. Many would value them.

Examples of household management.

19. As examples of good management I refer to cases Nos. 140, 146, 425, 446, 460, 470, 483, 487, 488, 147, 200, 411; and as a contrast between two families living in the same place and having the same income No. 483 may be compared with No. 484.

Relation of living to mental vigour and enterprise.

20. Although the health and strength of the people may be moderately well maintained on the existing dietary, it is more than probable that mental vigour and activity, as well as moral

courage and enterprise, are less where the diet is low. The labourers and their families in purely agricultural districts appear dull and unintellectual, not given to think, or to form a simple average, and hence in a national point of view this class may be healthy, but not equal in general value to others.

21. There can be no doubt that the mental and physical condition of the farm labourer and his family is much better in these localities, where remunerative labour other than farm labour can be obtained, than in purely agricultural districts.

WALES.

The inquiries have been prosecuted somewhat extensively in Wales, and have included both the northern and the southern division of the principality as well as the Isle of Anglesey. As it was understood that the dietary was poor and peculiar in South Wales, care was taken to make the inquiries in the central part, where there was not railway communication, and where manufactures or other occupations than farming scarcely existed.

Localities visited.

The localities visited were certain parts in the Isle of Anglesey not far distant from Beaumaris; the northern part of North Wales, from Denbigh to Conway, Carnarvon, and the southern part at Dolgelly and Machynlleth; South Wales, commencing at Aberystwith, and proceeding to Lampeter and Newcastle Emlyn in the interior to Milford Haven, Carmarthen, and Swansea, and the neighbourhoods surrounding those towns.

General characteristics of the labourers.

The farm labourers and their wives, although evidently a mixed race, were generally a sturdy muscular people, enjoying robust health, and many of those living in Anglesey and North Wales were remarkable for their chocolate coloured hair, large heads, tall and well-built bodies, as well as for their general intelligence. Such for the most part lived in tolerably good houses, pretty well furnished, had good incomes and plenty of food, and wore an aspect of comfort and health. In most of these respects the inhabitants of the purely farming districts of South Wales appeared to disadvantage. The houses were generally poor, with bare ground floors and but little furniture, and some were wretched; the men were less able and industrious, the food was poorer, the wages lower, and the general aspect was that of less health, intelligence, and comfort.

Increase of wages and price of food.

In all these respects there is great difference in various parts of the country, according as income may be derived from other sources, and employment found for the children. The large number of visitors to the beautiful districts of North Wales has greatly increased the value of all kind of produce, the rents of the land and houses, and the wages paid to the peasantry, whilst the slate quarries of North Wales, the iron works of South Wales, and the railways in both localities, offer labour to the sons of the farm labourer upon terms much more favourable than they find at their homes. Thus Mr. Gee informed me that in the neighbourhood of Denbigh, in 1850, he hired married labourers at 4*s.* 6*d.* per week and their food, whilst last winter he paid three inferior men 7*s.*, 8*s.*, and 9*s.* per week and their food. When hired by the year, as is the common practice in Wales, he paid to carters in 1850, 9*l.*, 5*l.*, and 1*l.* 15*s.*, with food and lodging, but during the last year he gave 16*l.* 12*s.*, 10*l.* 10*s.*, and 12*l.* Women servants received 5*l.* and 2*l.* 15*s.* in 1850, but in 1863 it was increased to 7*l.* 10*s.* and 6*l.* 10*s.* per year, with food and lodging. The food itself is so

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much dearer that in 1850 he purchased rounds of beef of the best quality at 2¾*d.* to 3½*d.* per lb. in the market, but now he gives 6½*d.* to 7*d.* per lb. for the same quality when bought in large quantities.

6. Food of lowest-fed classes, by Dr. E. Smith.

But whilst this improvement in the condition of the farm labourer has proceeded almost universally in North Wales, the wages with food in South Wales are still 4*s.* 6*d.* (Nos. 520. and 530.), 5*s.* (No. 523.), and 6*s.* (No. 521.), and yet at the same time the value of food has in general increased at nearly the rate observed in North Wales.

OUT-OF-DOOR OCCUPATIONS.

The almost universal result of this condition of things in South Wales is, that the boys and girls as they grow up, not finding any labour, or only uncertain and ill remunerated labour, and the parents being unable to sustain them, leave their father's home early, and proceed to England as servants, or go to the iron works or slate quarries in their own country, or to other mechanical employments in England, where constant and well-paid labour can be obtained. Many of these remain absent for a few years, until by thrift they have saved sufficient money to buy a cow and to furnish a cottage, when they return and marry, and either engage themselves as farm labourers wholly, or with a little holding of land which they may obtain. Hence the proportion of farm labourers who are advanced in life is much beyond that of the young men and women in their families.

FARM LABOURERS.

WALES.

Emigration.

Economy.

The most rigid economy is a marked character among the peasantry in Wales, and some instances in which this was an intelligent thrift, and had led to great comfort, came under my notice, as in Case No. 520., where a man with wife and daughter had but a few years before immigrated thither, and obtained a house with a very small field, upon which they have kept a cow, a pig, and some fowls, which supplied them with milk, butter, bacon, and eggs, both to eat and sell, and by which and 4*s.* 6*d.* per week obtained by the husband (besides his food) as a farm labourer, they had become amongst the most respectable of their class. Since the daughter had grown up she had become a dress-maker, and could earn 4*s.* per week on the average.

Women engaged in out-door work.

It is the practice throughout South Wales for the women to work in the fields, and indeed to perform almost all the family and out-of-door work elsewhere done by men, and sturdier, stronger, and healthier women could not be found. They differ much as to their household management. Their dress is very suited to their work, and being of woollen lasts for many years.

Men who are hired are usually paid their wages monthly.

Houses.

The houses in the interior of South Wales are for the most part exceedingly poor, consisting simply of mud or rough stone walls, with bare ground floor and thatched roof, a very small window, and a badly fitting door. The house consists of one room, with an enclosed bedstead in one corner, or more commonly there is an imperfect partition made by shelves, which support such crockery as they possess. I have found very good houses at Aberbank, recently erected on the property of Sir T. Lloyd, also at Nant, and in the neighbourhood of Bangor. They are, however, usually one storied, as in the new houses in Scotland. In the better class of Welsh labourers' houses the dresser and bedstead are well polished, and are important pieces of furniture, whilst the former is supplied with a wonderful supply of pottery and glass. When there is a room in the roof it is generally reached by a ladder, which may be removed at pleasure. The floor is sometimes of stone or of plaster. The universal whitewash on the outside greatly improves their appearance.

Firing.

The firing in some parts of Wales is of peat and turf, with sticks and furze, whilst in others it is prepared from a mixture of coal dust with

clay, and is made into balls. This burns very slowly, and retains the heat for a long time.

Small holdings of two to five acres are common in South Wales. These are cultivated entirely by the wife and children; but the husband gives perhaps a day in harvest time, which is repaid to the employer of the husband by the wife working a day or two for him.

The enquiries in the three districts of Wales comprehended 49 families with 215 members and 176 computed adults.

The members of the class of bread stuffs which were consumed were bread, flour, oatmeal, barley, peas, and rice. Bread ready baked was not purchased at all by the cases in Anglesey, and in only two cases in South Wales was it a principal member of the class, whilst in only 3 cases or 6 per cent. was it eaten at all. There is no standard weight of the loaf, neither is it sold at a variable price per lb., but the cost is invariable, whilst the weight of bread in the loaf varies with the market and the dealer. When baked at home, it was sometimes baked in loaves, and at others in flat cakes, over the open fire, called plank bread. The former was more common when there was an oven, and was generally preferred, since the heat in the latter case was apt to drive off the gas produced in fermentation, and to render the cakes sad.

Wheaten flour was used by all the cases in Anglesey and North Wales, and by 80 per cent. of those in South Wales, yielding a general average of 87 per cent. In 83 per cent. it was a principal member of the class, and was consumed on a total average of 25 lbs. per family and 7 lbs. per adult weekly. In almost all the cases it was white flour, of moderate quality, but in a few it was brown from the presence of sharps, and not from the large husk or bran. It was, however, often times mixed with barley in South Wales when baked into bread. It was a very common practice in South Wales for the labourer taking his food and weekly wages at the farm to have 2 or 3 bushels of wheat allowed him at a reduced price by the farmer, which was ground by him at the mill for family use. This was economical, doubtless, but the wheat was generally very poor, and did not yield more than 42 lbs. of flour to the bushel.

Oatmeal was procured by every case in Anglesey, and by 60 per cent. in North and 53 per cent. in South Wales, which was an average of 60 per cent. on the whole. In some cases, and particularly in South Wales, it was obtained from the farmer at a reduced price. In the majority of the cases it was simply used to make broth, sucan, or budram, which I shall describe under the head of meals, and was rarely used as bread. In South Wales, however, it was added to the barley in some cases, and made into cakes. In only one case was it the principal member of this class. The average quantity of oatmeal consumed by each family was nearly $2\frac{1}{4}$ lbs. and by each computed adult about $\frac{3}{4}$ lbs. weekly. There is a combination of oats and barley as they are grown together in the field termed shiprish or brithyd, which is made into bread.

Barley was formerly much more frequently used in Wales than at the present day. Only one of the cases in Anglesey, and about 20 per cent. of those in South Wales, now eat it, and in no instance did I meet with its use in North Wales, except at the farm houses. On the average of the whole it was eaten by about 13 per cent. of the families; and as in those instances it was a principal member of this class of foods, it gave an average of $28\frac{1}{2}$ lbs. for each of those families, but only $2\frac{3}{4}$ lbs. for each family throughout the country. A mixture of rye and barley is not unfrequently grown together, and ground into meal for bread. This, as well as barley alone, is now much more commonly eaten by the labourers in

farm-houses, whilst in families it gives place to wheaten flour, since the latter is lighter, and more agreeable to the eye and palate, and can be much more readily eaten without butter. It is, however, an economical grain, at the price at which it is sold, even when the large proportion of woody fibre in the husk and the diminished quantity of nitrogen in the grain is taken into account. There was a general belief that a labourer must consume a larger quantity of barley than of wheaten bread to obtain the required amount of nutriment; and it is only from its low price, the great poverty of certain districts, and the fact that it is often supplied by the farmers and gentlemen at wholesale price to the labourer (Cases No. 523., 530., 538., and 544.), that maintains its use. Even now the use of barley bread in many of the families who purchase it is more common in winter than summer, that is at the period when work is deficient, and poverty more pressing. The low price of fine wheaten flour, and the increase of income of the labourer, which is surely advancing, will before many years have passed induce the labourer universally to select the wheaten flour. I have had special inquiries made into the quantity of barley bread which is produced from a given weight of barley meal, and I find it to be 1·43 on the average.

Peas.

Peas were eaten by only 8 per cent. of the populations, but much more frequently in North than in South Wales. They do not form any important part of the dietary in general.

Rice.

Rice is somewhat largely eaten. Every family obtained it in Anglesey, and 60 per cent. of those in North and 40 per cent. of those in South Wales, so that it is consumed by 51 per cent. of the whole. In a few of the cases it was largely used, as Nos. 513., 527., and 541, but in the whole series the quantity was less than 1 lb. per family weekly. When used largely it was generally by the poorest families, and when potatoes were scarce.

Total consumption of bread stuffs.

The total quantity of bread stuffs reckoned as bread which was consumed by these populations was very large, viz., 18¾ lbs. in Anglesey, 14¾ lbs. in North Wales, and 13 lbs. in South Wales per adult weekly, or 14 lbs. per adult throughout the whole country.

Fresh vegetables.

Potatoes and green vegetables are very generally consumed throughout Wales, and in Anglesey and North Wales the use of them was universal. My enquiries in South Wales were made before the potato crop had been gathered, so that at that period less than 90 per cent. ate them. The average quantity consumed was much the largest in Anglesey, where potatoes were eaten twice a day, and amounted to 16½ lbs. per adult weekly, whilst in North and South Wales it was 4 and 5½ lbs. respectively. The quantity per family in Anglesey was 53¾ lbs. weekly, and in both North and South Wales a larger quantity was eaten than that recorded when they were plentiful. I found, however, one family (No. 524.) who had not eaten them for two years, and several who had not obtained any fresh vegetables for a month at a time (No. 524.), and for many months (No. 533.), without any ill effects having followed. Mr. Phillips at Newcastle Emlyn, however, stated that during the first year of the potato disease scurvy appeared among his patients, notwithstanding that fresh baked bread was eaten daily. In many instances the use of green vegetables as a separate dish was restricted to Sunday, but leeks and herbs were used daily in South Wales in the broths, to which I shall again refer.

Relation of bread stuffs and potatoes.

I particularly enquired if the quantity of flour or other bread stuff was materially diminished when potatoes were plentiful, and learnt that the difference was so much as 5 lbs. (No. 541.), 6 lbs. (No. 543.), and 8 lbs. (No. 547.), per family. Hence it was shown that potatoes are never regarded there as a principal article of food, but when they are abundant

they add to the total nutriment obtained by the people. It should be added, that usually the gardens attached to the cottages are larger than those in England: many are small fields, and are cultivated by the wife alone.

Sugars were eaten universally in Anglesey and North Wales, and by 90 per cent. of the families in South Wales. The total average was 92 per cent. The use of treacle was limited to 40 per cent., and was more frequent in Anglesey and North Wales. The average quantity of sugar consumed was 12¾ ounces in Anglesey, 8½ ounces in North Wales, and 6 ounces in South Wales, per adult weekly, and on the whole it was 7½ ounces.

Sugars.

Fats were eaten by 92 per cent. of all the families combined, and with the exact frequency in the three different divisions that has been recorded in reference to sugar. In only North Wales were dripping, lard, or suet eaten, and in 92 per cent. of the whole butter was the sole separated fat consumed. In Case 524. the quantity varied from 1 to 3 lbs. per week, and in all families less butter was eaten with fine flour than with barley bread. The average quantity consumed was very small in South Wales, viz., 3 ounces per adult weekly, whilst in North Wales it was 11¼ ounces, and in Anglesey 9¼ ounces. In Pembrokeshire the labourers at the farmhouses are limited to 1 or 2 ounces per day. The total average was nearly 6 ounces per adult weekly. It is very singular that lard should not be eaten by the farm labourer in South Wales, but that it should be reserved for sharpening tools or to be sold.

Fats.

Meat or bacon was eaten by every family in Anglesey and North Wales, and by nearly 80 per cent. of those in South Wales. The total average frequency with which one kind was eaten was 84 per cent., and both were eaten by the same family in 30 per cent. Butchers' meat was eaten by 30 per cent., and in South Wales by as few as 12 per cent. The total quantity of butchers' meat consumed per family weekly was only 8½ oz., or per adult 2⅛ oz.; and so small was the quantity eaten in South Wales that, with the exception of a family near to Swansea, only 1⅝ lbs. was eaten by the whole 32 families weekly. Moreover, these cases were such as obtained about 12 lbs. of the neck of veal in the six months (Cases 536 and 549.), consisting of at least 50 per cent. of bone. Case No. 512. obtained meat once a week, Nos. 504 and 511. once a month, No. 552. not for months, No. 508. four times a year, No. 521. one shilling's worth in four months, No. 513. not sixpence worth in five years, and the great majority of the cases never tasted it. Men living at farmhouses usually obtained hung beef, viz., beef salted and dried by hanging it to the roof of the house, as will be stated when referring to the meals. In the Isle of Anglesey and in various parts of Wales the only meat obtained in farmhouses was such as was killed in the winter and salted for use the following summer, thus following the now disused customs of our forefathers in England. In a similar manner the families in South Wales who were able to purchase meat usually bought a sheep and salted it, as in Case No. 520., and as occurs in the Western Highlands of Scotland.

Meats.

Bacon was eaten by every family in Anglesey and North Wales, and by 75 per cent. of those in South Wales. The total average quantity was 27 oz. per family and 7¼ oz. per adult weekly; but the quantity per adult weekly in the three divisions, Anglesey, North Wales, and South Wales, was 8 oz., 9 oz., and 6½ oz. In Anglesey and North Wales a pig was usually fed, whilst it was rare in South Wales. Many of these cases, as Nos. 2, 3, 4, 5, 7., and 18., were, however, obliged to sell it. Case No. 522. ate bacon only on Sundays, No. 523. had ½ lb. in a month

APPENDIX.

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

WALES.

Fish.

Milk.

No. 541. 1½ lbs. in six months, and No. 546. ate none for many weeks at a time.

The total quantity of meat and bacon consumed per family weekly was nearly 2¼ lbs., and per adult 10 oz. In the Isle of Anglesey the quantity per adult was 10¾ oz., in North Wales 15¼ oz., and in South Wales 7¼ oz. weekly.* Nearly one quarter of the cases in Wales did not obtain any kind of meat.

Herrings were eaten by 30 per cent. of the families, in numbers averaging from one to six per week.

Milk was obtained by every case in Anglesey, North Wales, and South Wales; 83 per cent. obtaining butter milk, 53 per cent. skimmed milk, and 6 per cent. new milk. Those who possessed a cow always made butter, and sometimes also cheese, from the milk, and hence did not drink new milk. Skimmed milk was purchased very cheaply, and in many cases, as Nos. 522. and 532., was given. Buttermilk was usually obtained once or twice a week without charge by those who went to the farmhouse to help to churn, or who bought their butter there, or they paid at the rate of six pints for 1*d.*; and as some butter was left in the buttermilk, many, as Case No. 548., preferred it to skimmed milk.

The quality of the milk was poor where the cows were fed on the hills; but in the valleys, as the Vale of Clwyd, it was of good quality. In some places ewes' milk was added to the cow milk, but I did not find any labourer's family using goats' milk.

The total average quantity of milk obtained weekly was—

24½ pints per family and 150¾ fluid oz. per adult in Anglesey;
21 „ „ and 178 „ „ North Wales;
11¾ „ „ and 66 „ „ South Wales;

South Wales in this, as in all the foods previously mentioned, occupying the lowest place. A few cases, as No. 524., were scarcely able to obtain any milk; and it must be borne in mind that buttermilk, which is obtained only once a week, and must be eaten within one or two days, does not exert a nutritive influence equal to that of a less quantity more regularly distributed throughout the week. The total of the whole consumption was 15¼ pints per family and 4¼ pints per adult weekly.

Whey.

Whey was drank by only ten of the families in South Wales, but it could have been obtained in any quantity without cost.

Cheese.

Cheese was not eaten by the families in Anglesey, but was largely used in South Wales. The frequency in North Wales was 54 per cent., and in South Wales 90 per cent.; giving an average frequency throughout the three divisions of 72 per cent. In North Wales the quality was good, whilst in South Wales it was skimmed milk cheese, with or without the addition of ewes' milk, and cost 2½*d.* per lb. new, and 3*d.* or 3½*d.* when a year old. The latter kind of cheese was richer in nitrogen than the former, but doubts may be entertained as to whether it would be equally well digested. The quantity consumed per family weekly was 7·1 oz. in North and 49 oz. in South Wales, whilst the quantity per adult was 1¾ oz., and 14 oz. in those divisions respectively. The total average quantity per adult was 9·8 oz. weekly. A few cases, as No. 521., obtained it but rarely, and not exceeding 3 lbs. in 6 months. Everywhere it was more usually eaten in winter than summer, except in harvest time, and in South Wales was taken by the labourer to the field when he dined away from home. One family of three persons in South Wales, No. 525., ate so much as 14 lbs. of cheese weekly; a portion of from ½ lb. to 1 lb. per week was also obtained by some of the families of those who lived at the farmers' houses, No. 536., which was brought home with a loaf of bread for the labourer's Sunday's dinner. In one case, No. 507., the cheese was consumed only on the Saturday.

Eggs were eaten by three families in North Wales, but were usually sold, as in the cases No. 504, 505, 506, 513, 516, 517, 520, 528, and 549.

Eggs.

Tea was drank universally in Anglesey and North Wales, and by 84 per cent. of the families in South Wales, yielding a general average of 90 per cent. The quantity was very large in Anglesey and North Wales, so much as 3¾ oz. and 3⅓ oz. per family, and 1 oz. and upwards, or ⅔ oz. per adult weekly, whilst in South Wales it was less than the half of that quantity, viz., 1½ oz. per family and 4 oz. per adult. The total average was a little over 2 oz. per family and ½ oz. per adult It is usually (always in South Wales) taken without milk. Its use is increasing in South Wales, so that the farm labourers' families may by it be divided into two not very unequal classes, those who supplant milk by tea, and those who do not take tea.

Tea and coffee.

Coffee was used by only 40 per cent. of the families, and in some cases, as No. 40., was taken by the labourer to his work in the fields.

Beer was most rarely drunk in any part of the principality.

Beer.

Such are the details of the dietary in Anglesey and Wales, and I have entered into them separately for each division, to show that much difference exists. The total weekly cost of the food per family was in Anglesey 14*s.* 4*d.*, in North Wales 15*s.* 3*d.*, and in South Wales 8*s.* 5½*d.*, whilst per adult it was 4*s.* 4¾*d.*, 3*s.* 8*d.*, and 2*s.* 3½*d.*, in their order. The total average was 12*s.* 8*d.* per family, and 3*s.* 5½*d.* per adult.

The quantity of carbon and nitrogen contained in the food for each computed adult was in Anglesey 60,784 grains and 2,521 grains, in North Wales 45,613 grains and 1,765 grains, and in South Wales 38,675 grains and 1,806 grains. All, but particularly the first, were above the average of the community, and the total average was 48,354 grains of carbon and 2,031 grains of nitrogen per adult weekly (when the free hydrogen in the food is calculated and reckoned as carbon the daily amount is 2,750 grains and the total carbon becomes 51,104 grains daily). The amount of carbon and nitrogen obtained for each 1*s.* was in South Wales 16,875 grains and 787 grains, in Anglesey 13,825 grains and 562 grains, and in North Wales 12,439 grains and 492 grains; an order differing from that of the total quantity of nutriment obtained, and showing how much more economically the money was spent by the poorer community. The total average per adult weekly was 14,713 grains of carbon and 614 grains of nitrogen for each 1*s.* expended.

Value of food, and nutriment obtained.

Amount obtained for 1*s.*

Meals.

Meals.

The following is the ordinary arrangement of the food at meals for farm labourers living at farmhouses:

At farmhouses.

Anglesey. *Breakfast*, 6 A.M.—Bread, butter, new milk, and sometimes oatmeal. *Dinner*, 12.—Bread, potatoes, and salt beef, three or four times a week. Potatoes and milk; bread and butter on the other days. *Tea Meal*, 4.—(This has been introduced within a few years.) Bread and butter and cold meat; or bread and cheese, eaten in the field. *Supper*, 7.—Milk and oatmeal stirabout.

In Anglesey.

North Wales. There is a difference in the food provided by the farmer, according as he is generous and well to do, or otherwise; and as the character of the farm in this respect is well known to the labourer, it is taken into account at the period of hiring.

North Wales.

Men. Liberal dietary. *Breakfast*, 6 A.M.—Broth from beef liquor, milk porridge (Poteslläeth) or *graual* or pap, and bread composed of five parts of barley meal and one part of flour, bread and butter afterwards. *Dinner*, 12.—Boiled beef, or veal and bacon, roast meat, liver and bacon, &c., with potatoes, carrots, or cabbage, and bread. *Supper*, 6½.—Bread and milk, or sometimes fleetings, followed by bread and butter.

Inferior dietary. *Breakfast,* 6 A.M.—Broth from meat liquor, or more commonly from bacon or other fat and water, and barley bread, followed by bread and butter. *Dinner,* 12.—Bread and butter milk in winter, and bread and fleetings in summer, followed perhaps by pork, beef, bacon, or liver three or four times a week, and on other days only bread and butter. *Supper,* 6½.—Bread and milk in winter, and bread and fleetings in summer, with bread and butter afterwards.

The butter at such a farm is made from whey only.

The quantity of milk eaten by each man is about three pints daily in the neighbourhood of Denbigh.

Women. Liberal dietary. *Breakfast,* 6 A.M. and *Tea,* 5 P.M.—Tea or coffee, with bread of equal parts of wheat and barley. *Dinner,* 12.—Meat broth, or bread and milk, if desired, followed by beef, mutton, veal, or lamb, with ham occasionally, and vegetables. *Supper.*—Bread and milk, or bread and butter of the above (medium) quality. (The family eat wheaten bread.)

Inferior dietary. *Breakfast,* 7½ and *Tea* 5 P.M.—As above. *Dinner,* 12½.—Potatoes and milk, fleetings, &c., followed by bacon or poor flesh meat, and bread and butter. *Supper.*—As above.

South Wales.

South Wales. Men. Case No. 520. Near Aberystwith. *Breakfast.*—Milk porridge, barley bread, and cheese. *Dinner.*—In winter, broth, from bacon and hung beef; potatoes and bacon, bread and cheese. In summer, potatoes and butter milk, meat, cold or fried, potatoes and bread. *Supper.*—Flummery (Llymru) or brose, and bread and cheese. There is no limit in quantity, and in the long days in summer a tea meal of bread and cheese is added.

Near Lampeter. *Breakfast* and *Supper.*—Milk porridge, bread and cheese or butter. *Dinner.*—Meat broth, containing portions of meat and bacon, with potatoes, turnips, and bread and cheese.

Llandussh. At this place about ¼ lb. of bacon is obtained once or twice a week. Bread and cheese, potatoes, milk and butter, unlimited in quantity.

Hawen near Newcastle-Emlyn. *Breakfast.*—Milk porridge and bread and cheese. *Dinner.*—Flummery (Llymru) and milk with bread, butter, and cheese. *Supper.*—Bacon and hung beef broth, with bread and cheese.

Little Honeyborough, Pembrokeshire. *Breakfast.*—Milk porridge with oatmeal, bread and two ozs. of cheese. *Dinner.*—Potatoes and bacon, always hot daily, and bread, but usually the farm labourers have meat and bacon only twice a week, and on other days milk and bargout (milk porridge), with bread and cheese or potatoes. *Supper.*—Broth from bacon liquor, with oatmeal, leeks, &c.

Nourishment in a given case.

This man eats weekly about 14 lbs. of barley bread, 10½ lbs. of potatoes, 7 oz. of butter, 3½ lbs. of bacon, 3½ pints of skim milk, and 14 oz. of cheese, containing 54,136 grains of carbon, and 1,935 grains of nitrogen.

Near Carmarthen. *Breakfast* and *Supper.*—Broth and bread, with cheese and bacon alternately. *Dinner.*—Broth and bread, sucan and butter milk.

Thus, as a general expression, it may be stated that they have milk two or three times a day. Broth once or twice, cheese once or twice, and meat daily, or two or three times a week, with an abundant supply of common bread and vegetables.

At the labourers houses.

The families of farm labourers have usually four meals per day, as Cases Nos. 503. and 507., but many in Cardiganshire and Carmarthen-

shire take only three. The following is the arrangement of food in the different parts of the country:

North Wales, near Denbigh (Case No. 507.), *Breakfast and Tea*:—Tea or coffee with bread and butter. *Dinner*:—Bread and milk, sometimes with meat, at others meat and vegetables, or broth (brywes). *Supper*:—Coffee or milk and bread and butter.

Near Bangor (Case No. 512.), *Breakfast and Tea*:—Tea, bread and butter. *Dinner*:—Vegetables and herring or bacon (no pudding or broth). *Supper*:—Porridge or rice milk.

Near Aberystwith (Case No. 523.), *Breakfast and Supper*:—Coffee, bread and butter or cheese. *Dinner*:—Gruel, bread and cheese. Wife keeps in health, but is not strong.

Near Lampeter (Case No. 524.), *Breakfast and Supper*:—Tea, bread and butter. *Dinner*:—Brywes and broth sometimes, and at others potatoes and bacon.

Llandussh (Case No. 530.), *Breakfast*:—Whey with bread and cheese. *Dinner*:—Potatoes and buttermilk, with bread and cheese. *Supper*:—Whey and broth made from bacon or fat only.

Hawen, near Newcastle Emlyn, *Breakfast*:—Gruel, coffee or tea, with bread and butter. *Dinner*:—Milk porridge, bread and milk, or potatoes boiled in the broth with other vegetables. *Supper*:—Brwyes and potatoes, if they have any.

Llangain, near Carmarthen, (Case No. 506.) *Breakfast and Tea*:—Tea, bread and cheese. *Dinner*:—Broth, bacon, bread, potatoes, and cheese.

Case No. 547. *Breakfast and Tea*:—Tea, bread and butter. *Dinner*:—Potatoes, bread and cheese or bacon thrice a week.

Case No. 549. *Breakfast and Tea*:—Tea, bread and butter and cheese. *Dinner*:—Broth, potatoes, bread, bacon, or cheese. *Supper*:—Bread and cheese. This family remarked that they did not long for meat when they had it in the house.

Hence they differ from those living at farmhouses, in that they supplant milk by tea and coffee, and have much less bacon and flesh meat. Hot broth is common, but puddings are almost unknown.

Several dishes have been mentioned in these dietaries, the names of which are unknown out of Wales, and it may therefore be well to state their composition.

Budran (also called Mwdran or Brwchan) is prepared by steeping oatmeal in water from 24 to 36 hours until it begins to ferment, after which it is skimmed, and boiled to the thickness of gruel. It is eaten with treacle.

Sucan or Llymru is prepared in the same manner as budram, but from the husks of oatmeal, and it is boiled until it is thicker. When it is cold it is gelatinous like blancmange, and is eaten with whey or milk. A preparation identical with this is made in Scotland from the husk of oatmeal, and is called Sowans.

Fleetings consist of a soft curd procured by adding buttermilk to boiling whey and stirring them well together. The curd is eaten with the liquid when hot or cold, and with the addition of bread.

Bargout is a preparation of oatmeal.

Brywes is a broth prepared by boiling bread, butter, or other fat, with salt, pepper, and herbs, in water, and to this oatmeal is sometimes added.

Cawl trwy ddwr, or water broth, is a similar broth into which potatoes enter largely, or in some parts it is only gruel with a little butter and salt.

Broths are chiefly of two qualities, as meat liquor is or is not used. In farmhouses beef and bacon are always boiled together, and the

broth is always made with the liquor. In poor families broth is more commonly made with vegetables, hot water and seasoning, with a little butter or dripping or other fat added, or with bacon liquor instead of hot water, and fat when it can be obtained. Aromatic herbs, as mint, thyme, sage, marjoram, and flowers of marigold, are largely used.

Roof beef or hung beef is simply beef salted and dried in the winter by hanging it to the roof of the house for the summer use, precisely as is the manner with bacon.

The following conclusions may be properly drawn from this part of the enquiry:

1. The inhabitants of Anglesey and North Wales are well fed, and spend their money economically.
2. They eat a large amount of bread stuffs and milk, with a moderate quantity of sugars and fats, and a small quantity of meat.
3. Cheese is eaten largely in South Wales, and with bread is there the staff of life.
4. The average income and expenditure for food are good.
5. In all respects the families in the Isle of Anglesey occupy the highest scale.
6. South Wales is inferior in nearly all respects to the other divisions; inferior in personal qualities, health, income, kind of food, and quantity of food. It is superior in the amount of cheese obtained, and in the greater economy in the purchase of foods.
7. South Wales is remarkable also for the very small quantity of meat and separated fats eaten, and for the many families who never obtain them, and proves that much health and strength may be maintained by a dietary of bread stuffs, milk and cheese. I have been exceedingly struck with the healthy appearance of most of those who most rarely eat meat or bacon.
8. It is to be regretted that the use of tea and coffee is increasing in the poor districts of South Wales, where, as a whole, the amount of nutriment obtained is not more than sufficient to maintain health, and where, therefore, there is no room for spending money upon luxuries.
9. By way of comparison I have introduced in Case No. 526. the dietary of a stone mason of the ordinary class in South Wales, which shows that in total nutriment it does not differ much from that of the average of the country.

SCOTLAND.

The enquiries were prosecuted in the Western Highlands, including the counties of Inverness and Aberdeen, and in the counties of Peebles and Roxburgh in the South of Scotland. It was intended to have included also some of the Western Islands, as Mull and Skye, but tempestuous weather and limited time did not permit it, a circumstance to be much regretted, as the dietary is known to be both low and peculiar in those situations.

In the Western Highlands particularly the amount of tillage is very limited, so that the number of farm labourers required is but small. A class of persons called crofters are more numerous, holding from two to five or ten acres of land, and labouring for others when disengaged, and when employment can be obtained. This class is similar to one found in Ireland (and not very unlike one met with in Wales), but it has no representative in England; and although the fact of their holding

land may seem to remove them from the class of farm labourers, they are in fact amongst the worst fed of the labouring population. Shepherds were met with in every district, and on every farm a foreman or grieve was engaged, who, whilst superintending the cultivation of the farm, worked himself, and was simply a higher class of farm labourer. In the Lowland Districts the pure farm labourer was more commonly found.

The remuneration of farm labourers in Scotland is almost universally partly in money and partly in kind; few instances only being met with where a money payment was the sole return, or where, as in the case of shepherds, the payment was wholly in kind. As this system leads to a certain uniformity in diet, both as to the kind of food eaten and the quantity consumed, it will be needful to quote the remuneration obtained by several of the cases which enter into the enquiry.

The house rent is almost everywhere free, and whilst in the remote Highlands the house is a hovel scarcely if at all above the worst form of Irish or Welsh cabin, in certain districts in the Lowlands as well as in the Highlands new one-storied houses of a very commodious kind have been built. In the Lowlands I may refer to the excellent houses built by Mr. Tweedie and others in Peebles-shire, and in the Highlands to those erected on the estate of Lord Abinger and in other localities where the proprietor's house is of modern date.

Payment in kind.

Houses.

Oatmeal is given weekly to the extent of the long stone (17½ lbs.), and the yearly supply to married men varied from 65 long to 192 short stones (14 lbs.).

Oatmeal.

Barley in yearly quantities of 8 stones was also given in Peebles-shire.

Allowances of barley.

Milk was usually given in quantities of 1 Scotch pint (3½ English pints) daily, but this varied somewhat with the abundance of the supply; and in the neighbourhood of Inverness it did not average more than half a Scotch pint.

Milk.

Potatoes or potato land were given, the former to an extent varying from 72 to 144 stones (14 lbs.) yearly, and the latter either in an unlimited quantity, or in a row of 1,000 yards for married and of 800 yards for single men. Usually the labourer finds the seed and the employer the land, whilst the labourer, during the time which is his employer's, cultivates the land.

Potatoes.

Firing is given in certain districts, and in others the fuel is simply carried for the labourer free of charge. In the former case the material is either coal or peat, and of the former 4 tons at 14*s.* per ton were allowed near Oban, and from ½ a ton to 2 tons at Inverness. When peat is supplied it is usually cut by the employers' labourers.

Fuel.

Shepherds and a few mixed labourers obtain food for and sometimes the use of one or more cows free. The former have in some cases the right to keep from 40 to 60 sheep free of cost, and to rear pigs and fowls. They also have the privilege of using braxy sheep, either in an agreed upon or in an indefinite number. In some districts the whole of the braxy sheep is taken by the shepherds, whilst in others none are allowed in return for the shepherd's duties, but are given for extra labour. In Peeblesshire the braxy meat is used at the farm house for all the labourers. The number of braxy sheep eaten yearly by the shepherds varied from 6 to 15 in the cases quoted.

Grazing.

Braxy meat.

Such is an outline of the mode of remuneration, but in order to estimate the whole advantage which each man obtains it is necessary to quote the particulars, thus:—

Oban, Case No. 554. 16*l.* House rent-free, 65 long stones of oatmeal, potato land producing 30 barrels of potatoes, 4 tons of coals, and feed for a cow.

Wages.

Kilmore, Case No. 555. 9*s.* weekly. House rent-free, and 72 stones of potatoes.

Dunstaffnage, Case No. 558. 28*l.*, and no allowances.

Kilmalie, Case No. 560. House rent-free, 17½ lbs. of oatmeal weekly, 72 stones of potatoes yearly, firing, feed for two cows and 60 sheep, 12 braxy sheep yearly.

Ditto, Case No. 561, 15*l.* House rent-free, 17½ lbs. of oatmeal weekly, 72 stones of potatoes yearly, firing, feed for 2 cows, 15 braxy sheep.

Near Fort William, Case No. 563. The same as No. 561., but no braxy sheep.

Inverness, 16*l.* to 20*l.* A single man obtains house or lodging rent-free, 67 stones (14 lbs.) of oatmeal, 48 stones of potatoes, and ½ a ton of coals yearly, besides 48 ounces of milk daily.

Ditto, 16*l.* A married man receives, besides his house rent-free, 90 stones (14 lbs.) of oatmeal, 48 stones of potatoes, and 1 ton of coals yearly, and also 1 Scotch pint (3¼ English) of milk daily.

Ditto, 22*l.* The grieve or manager receives the same advantages in house rent, milk, oatmeal, and potatoes as the last, and also 2 tons of coals yearly.

Case No. 568. Had the same advantages as the last, except that he had only 67½ stones of oatmeal, and was allowed to keep two pigs and 18 fowls.

Case No. 569. Besides house rent-free, had 78¾ stones of oatmeal, 144 stones of potatoes, and 26 cwt. of coals yearly, with half a Scotch pint of milk daily.

Case No. 570. Received the same as No. 569., except that the quantity of oatmeal was 67 stones, and the fuel was less definite in kind.

In the neighbourhood of Keith the married labourer obtains, besides his house rent-free, two pecks of oatmeal weekly and one Scotch pint of milk daily, potato land and fuel, and opportunity to keep pigs.

Single men, when living with the farmers, obtain an unlimited supply of certain foods, in addition to their wages.

Peeblesshire, 16*l.* to 20*l.* A married man receives house rent-free, 60 to 65 stones of oatmeal, with potato land, and the carriage of four tons of coals free yearly, besides one Scotch pint of milk daily. A shepherd, besides his house rent-free, had 60 stones of oatmeal, 96 stones of potatoes or 1,000 lineal yards of potato land, the carriage of his fuel, feed for one cow and 50 sheep, and, in addition, one month's food at harvest time. A ploughman had the same advantages, except the potato land was reduced to 800 lineal yards, and he had the use of as well as feed for one cow and no feed for sheep.

Case No. 576. Another shepherd at Drumelzier received house rent-free, 192 stones (14 lbs.) of oatmeal, the carriage of fuel free, potato land, feed and use of one cow and feed for 42 sheep, besides six braxy sheep yearly.

Case No. 573. Besides house rent-free, had 840 lbs. of oatmeal, 128 stones of potatoes, the carrying of his fuel, and the feed and use of one cow.

Cases Nos. 577, 578, and 579. Received each eight stones of barley yearly, and one Scotch pint of milk daily, with the cartage of their fuel. No. 577. had 17½ lbs. of oatmeal weekly, No. 578, 197 stones, and No. 579. 65 stones of oatmeal yearly, Nos. 577 and 578 had 128 stones, and No. 579. 192 stones of potatoes yearly.

Thus, with so large a part of the dietary supplied in fixed quantities, it was not difficult to obtain a proper estimate of the total nutriment consumed. The labourers were, however, slow either to appreciate the object of the enquiry, or to make the required estimates, or to give

Slow in answering.

the required information, so that it was needful to exercise much patience, and whatever tact might be possessed, and to give as much time to each case as would have obtained the answers from three cases in England. So great was the reluctance in the labourer to be personally questioned, that in some instances the beads of perspiration would stand upon his brow whilst passing through the examination, and nearly all gave their answers in very low tones. I think this resulted from slowness of apprehension of the object of the enquiry in the Western Highlands, combined with the characteristic caution of those in the South, and did not in the least imply that the results would not be entirely trustworthy, and this opinion was supported by the Scotch gentlemen who everywhere did me the favour to accompany me.

The number of families included in the enquiry was 29, comprehending 133½ members taking food at home and 113⅜ computed adults.

The total amount of nutriment obtained in Scotland was, per adult, 48,980 grains of carbon and 2,348 grains of nitrogen, and varied from 22,361 to 85,808 grains of carbon and from 1,003 to 3,955 grains of nitrogen, weekly. When the free hydrogen in the food is calculated as carbon the amount is 3,350 grains, and the total carbon daily becomes 52,330 grains. Nutriment obtained.

Of bread stuffs, wheaten flour, oatmeal, barley meal, peas, pea meal, rice and pearl barley were used. Bread stuffs.

Bread was not purchased in any instance ready baked, as a principal article of food, but in 30 per cent. of the cases it was purchased as an adjunct. It was prepared at home with wheaten flour, barley meal (Case No. 577.), or a mixture of the two, or with pea meal mixed with wheaten flour (No. 566.), and with barley meal (No. 569.) In all cases it was made into very small flat cakes called soanes or bannocks. Bread.

Wheaten flour was used by 62 per cent. of the cases, in quantities varying from 2¾ lbs. to 14 lbs. per family weekly. Its use above Fort William and in the neighbourhood of Inverness was much less frequent than in the neighbourhood of Oban, Fort William, and the South of Scotland. As a principal member of this class of foods, it was eaten by only 10 per cent. of the cases, and those were in Roxburghshire. Usually white flour was purchased; but cases were met with in which the inner husk of the grain, or sharps, remained in the flour. Flour.

Oatmeal was consumed by every family, and in 90 per cent. was the principal member of this class of foods. The quantity eaten per adult was upwards of 7 lbs. weekly, when conjoined with other members of this class. When it was the sole bread stuff eaten, the quantity allowed to each man was 17½ lbs. per week, and for women ½ or ⅔ of that quantity, as has been already stated; and I was desirous to ascertain if this large quantity was usually eaten. Upon this point I received diverse answers; some, as Dr. Maclean, senior, of Oban, affirming that it could not be eaten, and that a part was exchanged for other foods; whilst many labourers affirmed that they did eat it. It was usually prepared for the table in two forms, brose and porridge, the former consisting of oatmeal stirred into water which had just boiled, but which was not kept boiling; the latter of the oatmeal which had been well boiled over the fire. Besides these, the oatmeal was baked into cakes, and in some very thrifty families the remains of any mess of porridge were in the evening always thus disposed of. As to the statement that it was not unusual for workmen in Scotland to eat the oatmeal simply sprinkled in cold water, I was assured that such a course was unusual in the highest degree, and could only occur when the workman or traveller was distant from a dwelling or a fire. It is, however, very common in India for the labouring population to take corn sprinkled in cold water Oatmeal.

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

SCOTLAND.

for their early meal, and at other periods when travelling, but the grain is always first parched and is thus partially cooked. When working at a distance from home, the Scottish labourer usually carries with him a bag of oatmeal, and is permitted to cook it in a neighbouring house.

There is some variation in the quantity of oatmeal consumed according to the season of the year, and the abundance or scarcity of potatoes. Thus, in Case No. 557., the quantity is doubled when there are not any potatoes; conversely, in No. 562., the quantity is reduced one half when they have potatoes. In Cases Nos. 563. and 564. 28 lbs. of oatmeal with potatoes is increased to 52½ lbs. and 42 lbs. when no potatoes.

Whilst the relish for oatmeal is still exceedingly great in the Highlands, it is gradually giving way to the desire for wheaten flour in the Lowlands and in all places where there is much communication with other parts of the kingdom; but there is nevertheless a general belief that it is a stronger food than wheaten flour, and more sustaining under the pressure of severe labour. It is not yet ascertained whether the two are equally digested by Scotch stomachs, inured to the use of oatmeal in large quantities, or whether a larger portion of oatmeal passes off by the bowel unused. It was stated by many of the cases that oatmeal lessens the action of the bowel, but such is not the general opinion.

Barley and pea meal.

Barley meal and pea meal are used exclusively for baking into bread. Their use is almost unknown in the Western Highlands. Pearl or Scotch barley (No. 568.) is used in broth in the neighbourhood of Inverness and in the South.

Rice.

Rice is used *infrequently, and chiefly in the spring time,* when there are not potatoes.

Total consumption of bread stuffs.

The total average weekly consumption per adult of all the bread stuffs reckoned as bread was 12¾ lbs.

Potatoes.

Potatoes were eaten at the period of the enquiry by every family, and on a total average of 55¼ lbs. per family and 15 lbs. per adult weekly. The duration of the supply varies much, since some thrifty families so apportion each day's consumption that the same quantity is eaten throughout the year, whilst in Case No. 556. they would last but three and in Case No. 557 but four months.

The quantity of potatoes grown by the labourer in the North of Scotland has not been so great since as before the occurrence of the potato disease. Previous to that event the peasantry of that part of Scotland, like those of Ireland, obtained potatoes sufficient, with the addition of milk, for almost all their wants, and thus saved the expense of oatmeal and other bread stuffs, which they do not grow in sufficient quantity, and which have to be imported into the neighbourhood for their use. Moreover, the abundance of potatoes enabled them universally to rear and feed one or more pigs, which were usually killed for their own consumption. The lessened supply of late years of an article which cost them little but their labour has caused them to spend money over bread stuffs, and has either prevented the feeding of the pig, or has required the pig to be sold instead of being eaten by the family. Hence the loss of the potato in the Highlands of Scotland is felt by the labourer to have been a calamity almost as great as in Ireland, and indeed the similarity in these conditions of the same class in both countries is very striking. The belief of many persons, as Case No. 557., is that a portion of both potatoes and oatmeal is better than any quantity of either alone.

Alternative dietary of potatoes and oatmeal.

In several cases I obtained the alternative dietaries, with and without potatoes. I have referred to them under the head of oatmeal, but I will here state the relations of the nutriment contained in the two foods in the substituted quantities,

Case No. 557. substituted 35 lbs. of oatmeal for 168 lbs. of potatoes.
The oatmeal contained, carbon, 96,250 grs.; nitrogen, 4,900 grs.
The potatoes „ „ 129,360 „ „ 4,104 „
Case No. 562. substituted 35 lbs. of oatmeal for 196 lbs. of potatoes.
The oatmeal contained, carbon, 96,250 grs.; nitrogen, 4,900 grs.
The potatoes „ „ 150,920 „ „ 4,802 „
Case No. 563. supplanted 24½ lbs. of oatmeal by 196 lbs. of potatoes.
The oatmeal contained, carbon, 67,295 grs.; nitrogen, 3,430 grs.
The potatoes „ „ 150,920 „ „ 4,802 „
Case No. 564. supplanted 14 lbs. of oatmeal by 98 lbs. of potatoes.
The oatmeal contained, carbon, 38,500 grs.; nitrogen, 1,960 grs.
The potatoes „ „ 75,460 „ „ 2,401 „

Hence in each of these instances there was a considerable increase in the carbon supplied by the potatoes, and in the two latter there was a considerable increase in the nitrogen also.

Advantage of potato dietary.

Sugars.

Sugar was obtained by 96 per cent. and treacle by 20 per cent. of these populations on an average quantity of both of 22¾ oz. per family and 5¾ oz. per adult weekly. Treacle was eaten more abundantly when milk was deficient (Cases Nos. 555, 576 577).

Fats.

Fats were eaten by 91 per cent., and of these butter was selected by 90 per cent., lard or dripping by 40 per cent., and suet by 46 per cent. The average quantity consumed weekly was 15½ oz. per family and 4 oz. per adult. In many instances the butter was obtained from their own cows, and was therefore more abundant in summer (Case No. 557.)

Meat.

Bacon was obtained by 69 per cent. and butchers' meat by 60 per cent., whilst 90 per cent. ate one of the two, and 38 per cent. both kinds of meat. The total average quantity of both was 40½ oz. per family and 10¼ oz. per adult weekly. Bacon was eaten more abundantly in former times than now, for the reason already given. A few families included in the enquiry were still enabled to kill and eat their pig, but more commonly only one half of it was eaten (Case No. 560.), and still more frequently it was altogether sold.

Value of braxy meat.

The largest share of butchers' meat was obtained by the shepherds, since they ate the lambs and sheep dying of an acute disease termed braxy, and perhaps also of the staggers and other less acute diseases. The number of sheep obtained by each has been already stated, and the weight was variously estimated at from 25 lbs. to 35 lbs. each. It is usual to clear out the whole of the carcase, and to strip off any portion which is manifestly diseased, and then to wash it with salt and water and pickle it in salt. When decomposition has much progressed, and the flesh is very dark in colour, it is most unusual to eat it as human food, but it is given to the dogs. I found difference of opinion as to the healthfulness and savouriness of this meat. Dr. Maclean, senior, of Oban, stated distinctly that it was most unfit for human food; whilst many other persons who had not eaten it believed it to be quite wholesome, and the shepherds who ate it were universally of the latter opinion. There is some sense of shame on the part of those who eat it, when questioned respecting it, as if they felt that public opinion was against its use; yet there can be no doubt that it has been eaten in the Highlands of Scotland from time immemorial, that it is an important item in the food, and therefore in the wages of the shepherds, and it is asserted that it enters into the consideration of the value of a farm. Difference of opinion upon this question may have arisen rather from the degree of decomposition which is regarded as the limit of its fitness for human food by different persons and different farmers, and cases were mentioned to me where employers had given and labourers accepted for human food sheep which had lain dead for many days before they had been dis-

covered. The greater number of cases occur amongst lambs in the spring and early summer time; but as it is the custom to salt mutton, however procured, it constitutes a supply for the greater part of the year. This mutton is cooked chiefly by boiling; and one shepherd (Case No. 561.) declared both the mutton and the broth from braxy mutton to have a better flavour than that of ordinary mutton. A near neighbour of his (Case No. 560.) was of opinion that he had exaggerated its goodness.

When mutton is purchased it is usual to buy one or two sheep, weighing 40 lbs. or 45 lbs. each, at the end of the summer, and salt the meat for the winter. This is effected usually by the increased income which is obtained from the summer labour, and the saving which is then made by the use of vegetables, so that by rare thrift the peasantry in the Highlands often have meat more abundantly in the winter than in the summer time (Case No. 556.), a state of things entirely in contrast with that occurring in Ireland, where, as indeed in England also, the best diet and the greatest income go hand in hand. Amongst the farm labourers who have not braxy mutton it is not unusual for them to buy sheep's heads and plucks (Case No. 562).

Fish.

Fish is eaten largely in the Western Highlands, but in the localities which I have visited it is usually herrings obtained fresh, and salted, but not dried. A few persons by fishing obtain an important supply of other kinds of fish, as Case No. 557., and it is said to be most abundantly eaten in the Western Islands.

Herrings.

It is usual for the farm labourer to buy herrings by the barrel of 260 lbs., or by the half barrel, which will suffice for the year. Herrings were eaten by 35 per cent. and other kinds of fish by 22 per cent., and when meat or bacon cannot be obtained, or only in a very insufficient quantity, there can be no doubt that the herrings supply a very desirable kind of food.

Milk.

Milk is used universally, and was obtained by every case under enquiry. The quantity which is allowed to the labourer for his family is usually 1 Scotch pint or 3½ English pints daily, and when it is obtained from the labourer's own cow it may exceed or it may come short of this, according to the season of the year. The total average quantity obtained was 24½ pints or about 7 Scotch pints per family and 124¾ fluid ounces or 6¼ English pints per adult weekly. Of this 62 per cent. of the cases used skimmed milk, whilst new milk and butter milk were taken respectively by 35 per cent. and 44 per cent. Butter milk is not largely drank, as in Ireland, but is baked with the bread stuffs into cakes (Case No. 554.) In the middle of summer both butter milk and skimmed milk must usually be taken cold, since when they are boiled the cheese separates from the milk.

Whey.

Whey was not used by any of the cases as food for themselves, but was given by them to the pigs.

Cheese.

Cheese was eaten by 45 per cent. of these populations. It was always made of skimmed milk; and when the labourer possessed or had the use of a cow a small cheese weighing 2 lbs. or 3 lbs. was made every 10 or 14 days during the summer, and was eaten after it was a few weeks old (Cases Nos. 554, 560, and 561.) In other instances (Case No. 555.) cheese weighing 25 lbs. was purchased at a time, whilst some (Case No. 568.) did not consume more than 6 lbs. yearly. The average quantity consumed was 10⅓ ounces per family and 2½ ounces per adult weekly.

Eggs.

Eggs were obtained by only 5 per cent. of the cases, since, although fowls were kept very generally, the eggs were sold, and not eaten.

Tea was drunk universally, and by every case under enquiry, in quantities so large as 2½ ounces per family and nearly ¾ of an ounce per adult weekly, whilst coffee was consumed by only 26 per cent. of these populations. The use of tea has greatly increased of late years, and its cost is now noticeable in each family. Tea and coffee.

Beer and cider were not drank. Beer and cider.

Meals. Meals.

Having thus stated the quantities of food obtained, it will be interesting to note the combinations of them which are made for the different meals.

Single men living with farmers in the neighbourhood of Keith had for *breakfast*, porridge, milk and bread; for *dinner*, potatoes and other vegetables, milk and bread; for *supper*, porridge or soanes (oatcake). They had butter on Sundays, but *meat*, bacon, herrings, sugar, and tea were not allowed, unless exceptionally. In Peebles-shire they had, for *breakfast*, porridge and milk; for *dinner*, bacon and butchers' meat, vegetables, broth and bread, and sometimes milk; for *supper*, porridge, or mashed potatoes and milk. At the farm-houses.

When living together on the bothy system in the neighbourhood of Inverness they provided for *breakfast* (5½ A.M.) brose and milk; for *dinner* (mid-day), porridge and milk; and for *supper* (7 to 8 P.M.), potatoes, milk and bread. A few herrings or ½ lb. of meat were procured for the Sunday's dinner.

Labourers living at their own houses provided food for the meals as follows:— At the labourers' houses.

(Case No. 554.) *Breakfast* (9 a.m.):—Porridge, followed by bread and milk. *Dinner* (2 p.m.):—Potatoes, herrings, and milk, or meat, and sometimes cheese. *Supper* (7 p.m.):—Porridge or tea.

(Case No. 555.) *Breakfast*:—Porridge and milk, followed by bread and tea. *Dinner*:—Potatoes and fish or milk. *Supper*:—Porridge and milk.

(Case No. 558.) *Breakfast and Supper*:—Porridge and milk. *Dinner*:—Vegetables and milk, and sometimes herrings.

(Case No. 564.) *Breakfast and Supper*:—Porridge and milk, followed, at the former, by tea and oatmeal cakes.

(Case No. 567.) *Breakfast* (5½ a.m.):—Brose and milk. *Dinner and Supper* (7 to 8 p.m.):—Porridge, and milk and bread.

(Case No. 572.) *Breakfast*:—Porridge, milk, followed by tea, bread and butter. *Dinner*:—When at work, bread and butter, but when at home, potatoes, herring, or meat, and broth on Sundays. *Supper*:—Porridge, milk, and tea.

(Case No. 575.) *Breakfast*:—Porridge and milk, followed by tea, bread and butter, or cheese. *Dinner*:—Potatoes and bacon or meat, and milk and broth, when the meat is hot. *Tea*:—Tea, bread and butter. *Supper*:—A "*few*," porridge and milk.

The total value of the food was *3s.* 3¾*d.* per adult weekly, and the amount of carbon and nitrogen which was obtained for each 1*s.* was 14,868 grains and 716 grains respectively. Value of the food and economy of its expenditure.

On a review of the foregoing statements we shall arrive at the following conclusions:— Conclusions.

1. That the Scotch farm labourer is well fed, notwithstanding the want of delicacy which is found in his principal food.
2. The cost of food and the amount of nutriment obtained for the money are moderate.
3. The large quantity of milk and oatmeal supplied is of the greatest importance in his dietary.

4. The addition of the food supplied and the free house-rent added to the wages of the labourer give him a good income.
5. The plan of paying wages partly in kind and partly in money is of great advantage to the labourer, so long as the payment in kind is strictly limited to the most necessary articles of food and his house, since it assures to him a sufficiency of food at all times.
6. It would be to be regretted if the disposition which exists in the Lowlands, to convert the whole wages into a money payment, should prevail, since, on the one hand, it would tend to reduce the total value received as wages, and on the other would leave the labourer more entirely under the influence of his habits and those of his family, whether good or bad.
7. In like manner it is to the advantage of growing youths that the present system of living in the farm-house and at the farmer's abundant table should be continued, rather than that the farmer should chiefly or exclusively employ married men.

IRELAND.

Preliminary questions.

The enquiries were chiefly directed to the western side of Ireland, but included certain portions of the south and north in proceeding to and from the west.

Localities visited.

The route pursued was from Dublin to Tipperary, where enquiries were made in the neighbourhood of Thurles, and thence to Killarney. Tralee and Tarbert were also visited, in the county of Kerry, on the way to Limerick, and after pursuing enquiries in the neighbourhood of the latter city, the route was taken through county Clare to Galway. Thence I proceeded on the eastern side of Lake Corrib to Gort and Maam, preferring that to the western side, on account of the difficulty which exists in estimating the amount of fish which is eaten by the inhabitants of the western districts. Thence I pursued my enquiries in the neighbourhood of Tuam, and subsequently proceeded to counties Westmeath, Cavan, Monaghan, and Armagh.

It is therefore probable that information was obtained from the poorest as well as from some of the richer districts of that country.

Small holders.

In a large part of the western country it is usual for the labouring population to hold a very small quantity of land (from 2 to 10 acres), which they cultivate, and fill up their time by working as farm labourers when opportunity offers. This class is strictly analagous to the crofters of the Western Highlands of Scotland.

Few labourers.

In such positions I found but few purely agricultural labourers; and as there is but little arable land, and the evident desire of the proprietors is to render Ireland still more a grazing and stock-rearing country, it is probable that the numbers will not be greatly increased.

Labourers of two classes.

I found the farm labourers of two classes, viz., those who are constantly engaged by the same employer at wages from 10*d.* to 1*s.* per day, which remain the same all the year round, and those who have no permanent engagement, but find employment as opportunity offers. I was desirous to make enquiries chiefly amongst the former class, for their income, however small, being uniform and certain, the dietary could be readily ascertained; whilst amongst the latter the uncertain and variable amount of their income led to some variation and uncertainty of dietary, or led them to incur debts in periods of idleness which absorbed their income when in employment. The latter, however, constituted everywhere a large portion of the community; and whatever may be the merits or demerits of the population, there can be no doubt

Their condition.

that the absence of regular employment for the husband, and of remunerative employment for the members of the families, is the great evil of the country. Under present circumstances the latter class of persons are in the habit of entering the union during the winter season when work is not to be obtained, and for which period no preparation had been made by themselves. In both classes the younger members of the family, both male and female, as they grow up, leave their father's home in search of employment and sustenance, so that the families consisted for the most part of the parents and the younger children.

The general condition of these populations, although wearing an aspect of great wretchedness to English eyes, is not now unfavourable to health. Throughout the country I found them a fine, well-built, and often athletic race, with children sufficiently fleshy and rosy, and bearing all the marks of health. The wife, moreover, was usually more robust and healthy looking than is observed in England.

Condition not unfavourable to health.

The houses are for the most part wretched, consisting of a cabin built of mud or rough stones, imperfectly divided into two parts, having a bare ground floor and a thatched roof, and in a few parts of Connemara without windows, and sometimes without doors. Many of them have been built in former years by the previous tenants; and it is still the practice in Clare and Connemara for the landlord to find the materials, and the tenant to build the house, so that a wretched habitation, at a merely nominal rent, results. Hence, darkness and dirt form characteristics of most Irish cabins, and it is a matter of congratulation that the open air is near, and that the inhabitants live chiefly in it.

Houses.

Dung heap.

There is also almost everywhere a dung heap in the front of the house, and as the sites of the houses on the roadside are lower than the road, the rain which falls upon the dung heap accumulates and forms a mass of semi-liquid filth, through which the members of the family wade when leaving and entering the house. This is partly owing to the fact that the excellent roads in Ireland have been raised above the level of the land, and therefore above the level of the floor of the cottages, and also from the practice which exists by which a labourer obtains the use of potato land for one year in return for the manure which he puts upon the land, and which thus induces him to accumulate the manure from the pigs and other animals, with any otherwise useless portions of peat and other refuse.

This latter evil does not, however, occur so frequently in towns (altho' it may be found abundantly in the far-famed town of Killarney); and in many parts of Ireland which I visited the houses are of a much better description. Such is the case at Littleton in Tipperary, at Robertstown, county Limerick, the property of Lord Monteagle, and in the neighbourhood of Armagh on the estate of the Lord Primate. It is also a striking feature that the ruins of labourers' houses are to be met with throughout the whole country, but particularly in the west.

Rent.

There is much diversity in the conditions of the labourers in reference to rent. In many instances, and those chiefly in which the labourer is constantly employed by the same master, the house-rent is free, either by a tacit or stated agreement. In other instances the house-rent varies from 6*d.* to 1*s.* a week, but it is, as I was informed, very rarely paid. When land is attached to the holding the payment is usually but small, but in some instances it seemed to be much higher than would have been given in England. Food for a cow (Case No. 617) was sometimes granted by the employer at a charge of 3*l.* a year, without the labourer holding the land. Potato ground was commonly obtained free, but at a disadvantage, since the labourer must every year cultivate new ground, when he simply gives the manure

in return for the rent, and frequently occupies insufficiently cut and drained bog, which yields but a poor crop of potatoes, and those of inferior quality. In other instances the sum charged for potato ground was exceedingly high, 6*l.* or even 12*l.* yearly for the Irish acre, but in such the rent was in part regulated by the crop which was obtained.

It was stated to me by the labourers throughout the west that if they could obtain 6*s.* a week regularly they could live and bring up their families; and in forming an estimate of the value of this sum to them, it is needful to recur to other considerations. Thus, as has been shown in a majority of such cases, nothing is paid for house-rent and potato ground, and thereby nothing (except the cost of seed) for potatoes. The furniture of the house does not involve much outlay, nor its repair much cost. The wife and children are usually uncovered at both extremes of the body, and the covering of the other parts is not costly. There are no doctors' bills, nor any savings for future wants; and as the fuel is almost universally peat it is obtained at simply the cost of the labour of the children and of a trifle given for the land. Hence the whole income, or nearly so, may be expended in the food of the current week, and this will assimilate the condition of the Irish with that of the English peasant much more nearly than would otherwise appear.

Labourers estimate of necessary income.

But few expenses.

The food obtained by these populations is very simple and almost unvaried, and whilst it maintains them in health and strength, there is a general longing after the so-called luxuries of their brethren in England.

General character of food.

In forming an estimate of the amount of nutriment obtained by them I have sought to ascertain that which was their normal or usual amount, omitting reference to the improved dietary of the few weeks of harvest, and being unable to determine with accuracy the dietary in such portions of the winter season as do not permit of employment in the instances where the payment is not made throughout the year. Moreover in all cases there is an alternative dietary, one in which potatoes are wholly or nearly excluded, and the other in which they wholly supplant some or all bread stuffs, according to the season when potatoes are ready for food, and the duration of that supply. As my enquiries were made just at the division of the seasons many of the labourers were still living without potatoes, whilst a few had begun to eat the potatoes, and had intermitted the use of meal. Hence I have been compelled to introduce two dietaries for the same person in many instances, and shall give the details of the difference in the nutriment obtained when speaking of the potatoes.

Estimation of nutriment.

The enquiry included 52 families of 269 members and 236 computed adults, and of this number three-fourths resided in the western parts of the country.

Persons included in the enquiry.

The total average amount of carbon and nitrogen obtained per adult weekly in the use of meal dietary was 43,366 grains and 2,434 grains, and varied from 108,618 grains and 4,520 grains to 29,427 grains and 1,189 grains. (When the free hydrogen in the food is calculated as carbon the daily amount is 3,600 grains, and the total carbon daily became 46,966 grains.) The average amount obtained by young men who live at the farmer's house is 65,394 grains of carbon and 3,276 grains of nitrogen weekly, as shown by the dietary to be detailed on page 73.

Nutriment obtained.

In only one instance was ready baked bread obtained as a principal member of the class of bread stuffs, and that was in county Cavan; but in 26 per cent. bread was purchased as an adjunct to other foods.

Bread stuffs.

Bread.

of the same kind, and chiefly in the neighbourhood of Armagh. It was common for the labourer on going to his work to purchase a 1½*d.* or 2*d.* loaf for his dinner (Case No. 584.), and to take the chance of obtaining buttermilk or milk or other food to eat with it. The total average quantity per adult throughout the whole cases was only ¾ lbs. per week.

Wheaten flour in like manner was used by only 3 per cent. of the populations as a principal kind of bread stuff, but was consumed by 68 per cent. of the whole. Its use was the most constant in Galway, Tuam, and Armagh, but it was distributed widely over the whole districts under enquiry. The amount was small,—not exceeding on an average 2½ lbs. per adult weekly. It was employed in making cakes chiefly, but in some instances constituted a part of the Sunday's pudding, as in Case No. 620. It was also sometimes mixed with the other meals when making stirabout.

Wheaten flour.

Oatmeal was not usually eaten by the cases in Tipperary, Kerry, Limerick, and Clare, but was generally purchased in Galway, at Tuam, in Westmeath, Cavan, Monaghan, and Armagh. It was not anywhere the principal breadstuff, but was consumed by 26 per cent. of the population in an average quantity of 1·18 lbs. per adult weekly. The use of oatmeal is increasing wherever the means of the population will admit of it; some even (Case No. 618.) prefer it to potatoes. In most instances its use is intermitted when potatoes are plentiful. It is prepared as *stirabout* or *porridge*, but is more usually mixed with Indian meal.

Oatmeal.

Maize or Indian corn meal is used exclusively in this division of the kingdom (so far as my enquiries have extended), and there it is universally the staple bread stuff obtained. This is, however, not due to any preference for its flavour, nor altogether to a belief in its high nutritive qualities, but because of its furnishing, in the absence of potatoes, the largest amount of nourishment at the smallest cost. It would scarcely be an exaggeration to say that it is universally disliked, whilst at the same time it is held in high estimation as a temporary food until better times come, and is universally admitted to have been and still is of the greatest service to the labouring classes. It is procured at 1*s.* 2*d.* the 14 lbs., whilst wheaten flour or oatmeal would cost 1*s.* 9*d.* to 2*s.* 2*d.* in the same quantity, and hence where the sole aim is to sustain life and health, and but little thought can be given to the obtainment of what would be deemed luxuries, the Indian corn is as universally courted as it is disliked. It is right to add, that some persons admit that they could work better upon Indian meal than on other foods (Case No. 593.), and that when potatoes must be purchased it was by far the cheaper food.

Maize.

The use is wholly intermitted in the poorer families when potatoes are plentiful.

This food was procured by 92 per cent. of the populations in quantities averaging throughout the whole number of cases 10½ lbs. per adult weekly, which, when compared with bread, would be equal to 14¾ lbs. of the latter. It is universally prepared by boiling in water to the consistency of a soft pudding, very like the porridge in Scotland, and hasty pudding in England, and should be well boiled. It is called *stirabout*, and is eaten with sugar or milk. In some instances it is, either alone or when mixed with wheat flour, baked into cakes.

One family in Westmeath ate 7 lb. of rice weekly, but, with this exception, the use of bread stuffs other than those referred to was quite insignificant.

Rice.

OUT-OF-DOOR OCCUPATIONS.

FARM LABOURERS.

IRELAND.

Total quantity of bread stuffs consumed.

The total average quantity of bread stuffs eaten per adult weekly, when reckoned as bread, was no less than 20½ lbs.

Potatoes.

Potatoes were eaten conjointly with meal by 44 per cent. of the populations, and in one instance to the extent of 196 lbs. per family weekly, but only in an average quantity on the whole cases of 25 lbs. per family and 5¾ lbs. per adult weekly. When, however, the season arrives at which they are plentiful, they commonly supplant every other farinaceous food, and with buttermilk constitute the sole food of the peasantry. In this case the quantity allowed at a farmhouse is 3½ lbs. thrice a day, and in a family consisting exclusively of grown-up persons this quantity (¾ stone daily) is consumed by each man. They are cooked always in their skins, and almost always by boiling; and on entering a cabin at dinner time, a large black pot full of them may be seen emptied upon the bare table, whilst each person peels the potatoes with his fingers, with or without the aid of a knife, and dipping it in the salt, eats it. Buttermilk or skim milk which has become sour, and which is frequently like a thin jelly, is eaten or drank by mouthfuls at the same time, and in several instances a very small quantity of butter is placed in a vessel, into which some of the potatoes are dipped. In a very small proportion, and quite exceptionally (Case No. 599.), the potatoes are roasted in their skins, and eaten with cold milk; and in the season herrings or other fish are sometimes eaten with the potatoes (Case No. 610.) When potatoes are not plentiful they are in some parts of Ireland procured only for the Sunday's dinner (Case No. 621.) There can be no doubt, from the universal testimony of all classes, that potatoes are a most highly prized food amongst the labouring population of Ireland, and one in which they indulge as largely as the supply and the enlarged capacity of their stomachs will admit of; and I was desirous to ascertain whether this large and universal use of potatoes resulted from enjoyment of that food, or from a belief in its superior nutritive and sustaining qualities. I therefore asked the question of the farm labourers universally, and of the educated classes, when I had the opportunity. In reference to the first question, there can be no doubt that one cause of preference is the enjoyment which they furnish, and particularly when their softness and the sweet flavour is contrasted with the harsh taste of the Indian corn. So much is this the case that no kind of farinaceous food but fine wheaten flour could compete with it, and if this could be readily obtained (without the additional luxuries which would be purchased by any who could obtain fine flour), it would probably not greatly diminish the consumption of potato by those already accustomed to its use, but would be preferred by the younger members of the family, as their tastes became adapted to it. The second question was answered variously by different persons. The educated classes for the most part affirmed that a labourer could work better upon meal than upon potato, but their judgment was not based upon personal experience. The labourers themselves, however, differed upon this question; some (as Case No. 593.) asserting that they could work better upon meal, whilst others, (as Case No. 603,) and by far the larger number, affirmed that they could work better upon the potato.

But added to these considerations must be the fundamental one, that the potatoes scarcely cost anything, in many instances, and thus allowed money to be expended upon other necessaries, and where the sole object was to live this must ever have great influence over the judgment. The largest quantity of potatoes eaten by any family included in these enquiries was by Case No. 611., where 441 lbs. were eaten weekly by the family, and 70 lbs. by each computed adult.

Alternative dietary of

The alternative dietary to which I have already referred renders it necessary that I should show in detail the effect of the change upon the

quantity of nutriment supplied. In the following table I have cited the cases in which this is recorded in my notes, with the quantity of potatoes which would be eaten instead of a given quantity of meal which would be intermitted. In several of the cases, moreover, sugar was intermitted with the meal, and in others butter was added with the potatoes, and the nutritive values of these foods have been added accordingly.

The table shows the loss or gain in nutriment with the use of the potato.

Potatoes versus Meal.

No.	Potatoes.	Carbon with Potato. Grains.		Nitrogen with Potato. Grains.		
	Lbs.	Loss.	Gain.	Loss.	Gain.	
590	294	—	27,160	2,618	—	Includes sugar.
591	147	9,016	—	2,280	—	
592	189	90,353	—	5,615	—	
594	392	11,760	—	6,104	—	
595	168	105,965	—	6,108	—	
597	98	120,600	—	6,154	—	Includes sugar.
598	98	120,540	—	6,189	—	Includes sugar.
599	294	—	19,180	1,367	—	
600	196	—	44,520	—	533	
601	98	—	56,260	—	719	
602	392	17,360	—	4,040	—	
605	294	56,420	—	4,662	—	
609	127	82,810	—	4,919	—	
610	392	—	71,680	7,699	—	
611	441	82,460	—	—	4,522	Includes butter.
617	147	4,410	—	1,738	—	
618	294	—	10,780	2,492	—	
624	147	82,810	—	6,069	—	
627	220½	7,815	—	—	340	

Hence in a large majority of the cases there was a loss of nutriment when potatoes were substituted for meal, and in some instances the loss was so enormous as upwards of 100,000 grains of carbon and 6,000 grains of nitrogen weekly. The gains were also sometimes nearly as large, and when they have been deducted from the loss it leaves a total average loss for each family weekly of 29,619 grains of carbon and 2,938 grains of nitrogen and about ⅛ of those quantities for each adult weekly. When this total loss is averaged for the whole number of cases included in the enquiry, it will require a deduction of 2,384 grains of carbon and 236 grains of nitrogen for each adult weekly from the general average stated to occur at page 68 when meal was used during the period of the intermission in the use of meal.

Showing average loss with potatoes.

The diminution in the quantity of potatoes obtained by these populations since the potato famine has almost universally restricted the use of them in food to a portion of the year. It has also prevented the labourer obtaining money by their sale, and, perhaps, above all, it has prevented his rearing, feeding, and eating his pigs. Since that period the instances have been few in which the farm labourer has been able to eat his pig, much less to eat one pig and sell another, and as in the cases Nos. 585, 586, 587., 593., 595., 598, 599, 600, 607., 610., and 621, the pig is now sold, as is generally the case in England, to pay the rent, or to buy clothes or other luxuries. Hence, as in the case of the Scottish Highlanders, the labourer has exchanged that which supplied nearly all his wants, and cost but very little, for that which to supply his wants

Importance of the potato.

costs him much, and almost inevitably takes away from him his bacon, and the means of procuring other than the barest necessaries of life. It is impossible not to feel how great the loss has been, whilst at the same time one equally feels how great a blessing the substituted Indian meal has been in rescuing him from starvation. This year has yielded a larger and a better crop of potatoes than has occurred since the famine, and as the condition of the Irish farm labourer has doubtless much improved during the past few years, it may be anticipated that this year will lead to a more general establishment of one of the principal "institutions" of the country,—the rearing of the pig.

Sugar was procured by 80 per cent. of the populations in an average quantity of 21½ ounces per family and 4¾ ounces per adult. It was used chiefly with Indian meal, and therefore not in the potato season (Cases No. 590, 591., and 599), and when it was used with tea or coffee it was often restricted to Sunday, as in Case No. 586. Treacle was not eaten by any of the families.

Sugars.

Fats were obtained by only 40 per cent. of these populations, and in quantities averaging only 8 ounces for each family and 1¼ ounces for each adult. Of these dripping, lard, and suet were obtained by only one family, so that butter of a very cheap kind was the only fat used by 38 of 40 per cent. It was eaten commonly with the potatoes.

Fats.

Meat of some kind was eaten by 57 per cent., but of both kinds, by only 3 per cent. Bacon alone was procured by 40 per cent., and butchers' meat by 20 per cent. The average quantity of the whole was 21¼ ounces per family and 4½ ounces per adult weekly. American bacon of very good quality was sold in the market at Thurles at 3½*d.*, per lb., and was eaten by many families, as Nos. 594 and 596. The quantity was, however, not only small, but was obtained frequently at long intervals, as in Case No. 586., where ½ lb. a month, Cases No. 611 and 620., 1 lb. a month, and Case No. 624., 2 lb. a month was procured.

Meats.

Butchers' meat was of various kinds, but American pickled pork was usually obtained by some families, as Nos. 599 and 604. Both bacon and butchers' meat were less commonly obtained in Tipperary, Kerry, Limerick, and Clare than in the other localities visited. Some families obtained it only for the Sunday's dinner (No. 590.), others (No. 587.) ½ lb. a month, (No. 588.) 3 lb. a month, (No. 595.) 5 lbs. once a month, (No. 601.) 1 lb. in three months, (No. 603.) six times a year, and many procured it only on two feast days in the year (Cases No. 585. and 617.)

I was desirous to ascertain the opinion of persons so circumstanced as to the necessity for the use of meat, and when I met with a thoughtful and intelligent labourer I asked the question. The answer generally was that they should like to have more of it, but it was not necessary either for health or strength.

Labourers opinion as to the necessity for meat.

Herrings were not by any means so generally obtained as in the Highlands of Scotland, but it is probable that all kinds of fish would be more generally procured on the sea coast than in the inland districts which I chiefly visited. They were not usually eaten when milk could be procured in sufficient quantity, as by Case No. 600., and therefore only for three months of the year, as in Case No. 620., and six months, as in Case No. 621. When eaten it was commonly with hot boiled potatoes at supper, as by Case No. 590. 31 per cent. of the cases obtained them.

Fish.

Milk is one of the two or three staple foods of these populations, and was obtained by 98 per cent.; new milk was eaten by 22 per cent., skimmed milk by 53 per cent., and butter milk by 42 per cent., so that more than one kind was eaten by many families. The total average quantity of milk consumed was 30½ pints per family and 6¾ pints per adult weekly; but as I could not always obtain a fair average for the

Milk.

whole year, as the quantity is much less from Christmas to May than at other seasons, I think this is somewhat more than is procured throughout the year. When milk is absent there is an attempt at a substitute in herrings, sugar, coffee, and tea. In the middle of summer the butter milk and skimmed milk are often sour, and cannot be boiled, and then present a thick blancmange-like appearance when moved by the spoon.

Whey was not used by any of the families.

Cheese was not procured by a single family, on the plea that they could not afford it, so that what cheap cheese is to the Dorsetshire, Somersetshire, and South Wales labourer skimmed milk and butter milk are to the Irish peasant. Eggs were eaten by 20 per cent. of the families. Many families, as Nos. 583., 586, 587, 588, 589., 596., 599, 600, 601., 610., 618., 630, 631., and 633., always sold the eggs produced by their fowls, whilst others, and by far the smaller number, ate them.

Tea is used very generally in towns, and sometimes to a large amount, whilst in some of the country places its use is almost unknown. 57 per cent. of the whole cases drank it, but the quantity upon the whole did not exceed 1¼ oz. per family, and ¼ ounce per adult weekly. In only 24 per cent. was coffee drank, and in a few instances, as Case No. 586., tea and coffee were mixed together to make them stronger!

Whey. Cheese. Eggs. Tea and coffee.

Beer and cider were not drank at all by the farm labouring populations.

Beer and cider.

I will now cite a few instances to show the general arrangement of the food at meals.

Meals.

The custom is almost universal to have three meals a day; but in Galway and near to Tuam I found many who, under ordinary circumstances, ate only two, at about 9 a.m. and 2 p.m., and went to bed immediately on arriving at home after the day's labour.

When living at farmhouses, either altogether or for the day, men have either Indian meal and oatmeal stirabout, with milk, three times a day, or, when potatoes are plentiful, they have two meals of potatoes and milk and one of stirabout and milk, or they have potatoes at all the meals. The allowance when the quantity is limited is 10½ lbs. of potatoes and three pints of milk daily. A single woman in Tipperary had for breakfast and supper oatmeal and Indian meal stirabout with new milk and skimmed milk, and for dinner potatoes and milk with brown bread, and eggs perhaps twice in the week. The quantity was unlimited.

At farmhouses.

The following are the examples which I noted down of the food eaten at meals by the farm labourers at their own houses:—

At labourers' houses.

Tipperary (Case No. 586.) *Breakfast*:—Stirabout and milk *Dinner*:—Potatoes and milk. *Supper*:—Stirabout and milk.

Ditto (Case No. 587.) *Breakfast*:—Stirabout and milk. *Dinner*:—Bread and milk. *Supper*:—Stirabout and milk.

Ditto (Case No. 588.) *Breakfast*:—Stirabout and milk or potatoes and milk. *Dinner*:—Stirabout or potatoes and milk. *Supper*:—Stirabout and milk or potatoes and milk.

Kerry (Case No. 595.) *Breakfast*:—Stirabout and milk. *Dinner*:—Stirabout and milk. *Supper*:—Stirabout and milk.

Westmeath (Case No. 622.) *Breakfast*:—Stirabout and milk. *Dinner*:—Bread and bacon or potatoes and milk, or both. *Supper*:—Stirabout and milk or potatoes and milk.

Ditto (Case No. 624.) *Breakfast*:—Stirabout and milk. *Dinner*:—Potatoes, milk, and butter. *Supper*:—Potatoes and milk.

Value of food, and nutriment obtained for it.

Conclusions.

Cavan (Case No. 625.) *Breakfast*:—Stirabout and milk. *Dinner*:—Potatoes or cabbage. *Supper*:—None, except in full work.

Ditto (Case No. 626.) *Breakfast*:—Bread and milk. *Dinner*:—Potatoes and milk. *Supper*:—None.

Armagh (Case No. 628.) *Breakfast*:—Tea, bread and butter, or eggs. *Dinner*:—Potatoes, milk, and butter. *Supper*:—Tea, bread, and butter.

Thus the chief food is stirabout and milk, and in the west of Ireland the chief variation in the meals consisted in the addition of potatoes. In the central and northern parts bread is used, but at the breakfast and supper or at the dinner only, and is not used regularly at all the meals. Bacon is sometimes added, and in Armagh the luxuries of tea, butter, and eggs are obtained.

The total average value of the food obtained was so small as 9*s.* 5¾*d.* per family and 1*s.* 9¾*d.* per adult weekly, but the amount of nutriment obtained for each 1*s.* was no less than 24,000 grains of carbon and 1,341 grains of nitrogen.

The following considerations may be cited by way of conclusions:

1. The amount of food obtained under normal conditions by the labourers in regular employment suffices to keep them in good health and strength. No food of a more compendious form can be obtained at the same cost by those who grow all the potatoes that they eat.
2. The variety of food is very limited, and there is a craving on the part of the labourers and their families for more.
3. Whether greater variety is strictly necessary may be doubted, seeing that the health and strength are maintained under existing conditions.
4. Any increase in the variety of foods which should cause a less economical expenditure of money would reduce the amount of nutriment contained in the dietary, and be so far likely to lead to disease rather than to health.
5. The abundance of meal, potato and milk, which is obtained, is of the greatest value.
6. No attempt should be made to reduce the quantity of these necessary and cheap foods until the wages of the labourer have so far increased that he may purchase an equal amount of nutriment in other forms.
7. The general introduction of tea and coffee into the western part of the country is to be deprecated, since it would not only lessen the economic value of the foods, but would lead to the diminished use of the highly nutritious milk.
8. The introduction of meat in greater abundance would be desirable, as indicating an improved condition of the populations,—one above that of constant peril from want,—but is not necessary for the maintenance of health and strength, so long as a good supply of potato, meal, and milk exists.
9. It is not known whether any larger proportion of the nutriment now supplied passes off unused by the bowel than occurs in countries where more compendious foods are eaten, and therefore it is not possible, as yet, to fix the absolute value of this dietary.
10. The amount of fluid taken into the body in the potato and milk dietary is enormous, so much as 10 lbs. daily in the full dietary.
11. In the present state of low wages of these populations, the abundant use of potatoes is most desirable, except in those cases

where potatoes are bought; and no attempt should be made to lessen it, unless by increase of wages, and the introduction of wheaten bread.

12. The use of Indian corn meal can only be a temporary expedient, if the condition of the labourer should continue to improve, since, notwithstanding its real economy, it is distasteful to the people.

13. All attempts to improve the exterior social condition of the people, as seen in their houses and dress, must be accompanied by an increase of their income, since any sum abstracted from their present income would lessen the amount of food obtainable, and thereby induce disease.

14. The leading idea to be borne in mind is, that the present condition of the Irish labourer is a mere struggle to preserve health and strength.

15. More constant labour, even at the present low rate of remuneration, would be a great gain; but the introduction of other occupations than that of farming would improve the condition of this class, by increasing the rate of wages and the general wealth of the people.

16. The rate of wages in the west is very low, in relation to the value of the land, and many landlords seek to keep them low rather than to raise them.

17. The increase of the cottage garden system, whereby the labourer may profitably occupy his spare time in the production of a larger quantity of potatoes or other foods, would be of material benefit.

COMPARISON of the RESULTS obtained in the FOUR DIVISIONS of the KINGDOM.

It now remains only to show a comparison of the results of this inquiry in its leading particulars in reference to the four divisions of the Kingdom, viz., England, Wales, Scotland, and Ireland, and then to contrast the whole with that of the indoor occupations.

Inquiries more extensive in England and Wales.

1. The inquiries have been more extended in the two former than in the two latter, since in reference to the latter no attempt was made beyond that of obtaining a hasty glance, and to mark the points of agreement and contrast with the dietary of England.

Number of.

2. The number of families visited in England was 370, in Wales 49, in Scotland 29, and in Ireland 52.

Carbon and nitrogen.

3. The total average amount of carbon and nitrogen obtained per adult weekly was 45,343 grains and 2,101 grains; in England it was 40,673 grains and 1,594 grains; in Wales 48,354 grains and 2,031 grains; in Scotland 48,980 grains and 2,348 grains; and in Ireland with the maize dietary, 43,366 grains and 2,434 grains. When the free hydrogen is calculated and reckoned as carbon the total daily quantity of carbon is 48,418 grains, whilst that of England was 43,279 grains, of Wales 51,104 grains, of Scotland 52,330 grains, and of Ireland 46,966 grains. Hence in each of these items the total quantity obtained was less in England than in Wales, Scotland, or Ireland.

Cost of food.

4. The cost of this food was on the whole average 2*s.* 10¾*d.* per adult weekly. It was in England 2*s.* 11⅛*d.*, in Wales 3*s.* 5½*d*, in Scotland 3*s.* 3¾*d.*, and in Ireland 1*s.* 9¾*d.* Hence Ireland far exceeded the other

Nos. 6, 7. *Conditions of Nourishment.*

6. Food of lowest-fed classes, by Dr. E. Smith.

COMPARISON OF ENGLAND, WALES, SCOTLAND, AND IRELAND.

divisions in cheapness of living, whilst in England the value of the food consumed was less than in Wales or Scotland.

Economy of selection.

5. The economy with which the money was expended was such as to give for each 1*s.* 16,495 grains of carbon and 791 grains of nitrogen on the average of the whole kingdom. In England it was 12,398 grains and 495 grains; in Wales 14,713 grains and 614 grains; in Scotland 14,868 grains and 716 grains; and in Ireland 24,000 grains and 1341 grains. Hence Ireland was most conspicuous in the amount of nutriment obtained for the money expended, obtaining nearly twice as much carbon and more than 2½ times as much nitrogen for the money as was procured in England. Then followed Scotland in point of economy, and England was much the lowest.

Bread stuffs.

6. The amount of bread stuffs obtained per adult weekly was 13·28 lbs. In England it was 12·23 lbs., in Wales 14 lbs., in Scotland 12¾ lbs., and in Ireland (with the maize dietary) 20½ lbs. Hence Ireland occupies one end of the scale and England the other.

Sugars.

7. The quantity of separated sugars which was eaten on the total average was 6·6 oz. per adult weekly. In England it was 7·38 oz., in Wales 7½ oz., in Scotland 5¾ oz., and in Ireland 4¾ oz. Hence England and Wales occupied the head and Ireland the foot of the scale.

Fats.

8. The quantity of separated fats on the total average was 5·1 oz. per adult weekly. In England it was 5·5 oz., in Wales 5·8 oz., in Scotland 4 oz., and in Ireland so little as 1¼ oz. Hence Ireland did not obtain so much as ¼ of the quantity of separated fats which was in use among the labourers in England and the other parts of the kingdom.

Meats.

9. Meat or bacon was eaten by 92 per cent. of all the families included in the inquiry. In England the per-centage was 99, in Wales 84, in Scotland 72, and in Ireland 59. The quantity was in the whole kingdom 14 oz. per adult weekly. In England it was 16 oz., in Wales 12¾ oz., in Scotland 10¼ oz., and in Ireland only 4½ oz. Here again England obtained the largest and Ireland the smallest quantity, the former being nearly four times the latter.

Fish.

10. Fish in the form of salted but not dried herrings was much more abundantly used in Scotland than elsewhere, and in no other division of the kingdom did fish in any form occupy a prominent place in the general dietary of the country.

Milk.

11. Milk was obtained on the whole average in quantities of 52 fluid ounces per adult weekly. In England it was only 32 oz.; in Wales it was 85 oz.; in Scotland 124¾ oz., and in Ireland 135 oz. weekly. Under the head of milk is included new milk, skimmed milk, and butter milk. Hence England is not only at the foot of the scale, but almost immeasurably below the position held by the other divisions of the kingdom. Ireland and Scotland are at the head.

Cheese.

12. Cheese was eaten on the whole average in quantities of 5 oz. per adult, weekly. In England the amount was 5·4 oz.; in Wales 9·4 oz.; in Scotland 2½ oz., whilst it was not at all obtained in Ireland. Hence Wales and England occupied the head of the scale.

Tea.

13. Tea was drank by 94 per cent. of the whole population, the per-centage varying from 100 in Scotland to 99 in England, 90 in Wales, and 57 in Ireland. The quantity per adult, weekly, was, on the whole country, 0·5 ozs., whilst in England it was ·51 ozs.; in Wales ·6 ozs.; in Scotland nearly ¾ oz.; and in Ireland about ¼ oz. Its use was therefore far more general and abundant in Scotland and England than in Ireland.

General comparison of the whole.

14. Thus on the whole there was the most nutriment, the least sum spent upon food, the least variety of food, the greatest economy in the selection of food, the most breadstuffs and milk, the least sugar fats

meats, cheese, and tea, in Ireland. There was the least amount of nutriment, the greatest variety of foods, the most costly selection of foods, the least quantity of breadstuffs and milk, the greatest quantity of sugars, fats, and meats, in England.

COMPARISON of the RESULTS of the enquiry in reference to in-door and out-door occupations.

This may be effected by comparing Table No. 2. with that which follows, the former showing certain facts in reference to in-door the latter in reference to out-door occupations. The comparison may be made so easily that it is not necessary to enter into any detailed account, but it may be stated that the in-door labourers obtained much less nutriment, spent less upon foods, purchased food with much less economy, obtained much less breadstuffs, and somewhat less fats, meats, and milk; but in reference to those foods which are regarded as the luxuries of life the difference between the quantity obtained by these two classes was small. Tea was more largely consumed by the in-door labourers.

TABLE No. 3.

SHOWING the frequency per Cent. of the whole cases with which certain CLASSES of FOODS were eaten, and the QUANTITY PER ADULT WEEKLY.

	CARBON.				NITROGEN.		BREADSTUFFS.	SUGARS.		FATS.		MEATS.		MILK.		CHEESE.		TEA.	
	Grains Per Adult.	Grains Per Is.	Free Hydrogen reckoned Carbon.	Carbon and Free Hydrogen.	Grains Per Adult.	Grains Per Is.	Lbs.	Per Cent.	Oz.	Per Cent.	Oz.	Per Cent.	Oz.	Per Cent.	Fluid oz.	Per Cent.	Oz.	Per Cent.	Oz.
Out-of-Door Labourers :—Agricultural only.																			
England	40,673	12,308	2,000	43,273	1,594	614	12·32	93	7·33	99	5·5	99	16	72	32	57	5·4	99	·5
Wales	48,854	14,713	2,750	51,104	2,031	614	14·	92	7·5	92	5·8	84	12½	100	85	72	9·4	90	·6
Scotland	48,980	14,808	3,350	52,330	2,343	716	12½	96	5½	93	4·6	72	10½	100	124½	48	2½	100	½
Ireland	43,366	24,000	3,600	46,966	2,434	1,341	20½	82	4½	42	1½	59	4½	98	135	0	0	37	½
Total	45,343	16,495	.	.	2,101	791	13·28	96	6·6	92	5·1	92	14	82	52	50	5·	94	·5
In-door Labourers :—Silk Weavers, Needlewomen, Kid Glovers, Stocking Weavers and Shoemakers.																			
England	28,876	11,217	2,000	30,876	1,192	445	9·6	96	8·	98	5·	96	13·6	72	18	.	.	96	½

NOTE.

Whilst this report was passing through the press, I received from the India Office a report made by Civil Medical Officers of the alimentary substances used as food by the industrial and labouring population throughout the Bengal Presidency, which contains much information of a nature similar to that contained in this report; but as no computation was made of the nutritive elements contained in the dietaries, and no department of the government appeared to have funds wherewith the expenses of the computation could be defrayed, the report is practically valueless for comparison with the English dietaries. I have, however, made an abstract of more than 100 of the reports contained in that document, which will be issued in the transactions of the British Association for 1863. A similar report was more recently issued in reference to the foods in use in the *Madras* Presidency, but in scarcely any instance is the daily dietary of an adult person given by the reporters.

TABLE showing certain TOTAL WEEKLY QUANTITIES of FOOD obtained by FARM

COUNTY.	No. of Families.	No. of Members of Families. Above 10.	Below 10.	Total.	Reckoned as Adults.	Breadstuffs. Per Adult.	Potatoes. Per Family.	Potatoes. Per Adult.	Separated Sugars. Per Family.	Separated Sugars. Per Adult.	Separated Fats. Per Family.	Separated Fats. Per Adult.
						lbs.	lbs.	lbs.	oz.	oz.	oz.	oz.
Cornwall	7	20	15	35	27½	0½	.	.	17·7	4½	16·5	4½
Devon	34	104½	85	189½	150	12	.	.	19·9	5½	16·	3½
Somerset	25	79	75	154	112½	10½	.	.	16·3	3½	14·6	3
Dorset	19	66	53	119	92½	13	.	.	17·	3½	21·3	4½
Wilts	17	59	51	110	84½	12½	.	.	25·8	5·	28·2	5½
Gloucestershire	9	32	30	62	47	12½	30·3	15½	33·	6½	20·	3½
Worcestershire	7	21	29	50	35½	12	50·4	10·	35·	7	26·6	5½
Salop	3	7	12	19	13	15½	35·6	8½	40·	9½	27·3	5½
Lincolnshire	5	21	14	35	28	12½	42·5	7½	38·4	7	18·4	3½
Notts	7	27	15	42	34½	13½	31·8	6½	31·1	8	18·	3½
Leicestershire	9	28	21	49	38½	12	34·3	8·	42·6	10	27·3	6½
Cheshire	5	15	11	26	22½	11	36·	8	71·2	15½	27·2	6
Derbyshire	9	35	24	59	47	12½	.	5½	51·5	10·	27·5	5½
Northumberland	7	18	15	33	24½	15½	25·4	7½	43·4	12½	25·1	7½
Durham	4	14	4	18	16	11½	32·	8	39·	9½	41·	10
Westmoreland	5	16½	18	35½	25½	12½	39·6	7½	54·4	10½	33·6	6½
Cumberland	5	13	8	21	17	12½	16·	4½	46·4	13½	27·2	8
Lancashire	3	8	5	13	10½	11	34·	4½	50·	16	36·	10½
Staffordshire	9	29	20	49	39	11	24·	5½	48·	11½	32·	7½
Warwickshire	8	27	7	34	30½	11½	36·1	9½	55·	14½	24·2	6½
Northamptonshire	10	29	24	53	45	11½	38·9	8½	32·4	7	25·6	5½
Norfolk	7	28	21	49	38½	12½	16·4	3	29·1	5½	15·7	2½
Suffolk	5	15	11	26	20½	13	38·	9½	46·4	11½	37·6	9½
Essex	6	17	8	25	21	14½	28·5	8	26·6	7½	24·	7
Kent	6	17	5	22	19½	12½	15·8	5	38·6	11½	46·6	14½
Sussex	8	22	23	46	33½	12½	14·3	3·4	40·5	9½	40·5	9½
Surrey	6	14	7	21	19	12½	17·	5½	38·	12	32·	10
Hants	3	13	18	31	24	11	30·6	6½	22·	4½	28·8	6
Oxfordshire	11	42	31	73	58	11	34·	6½	29·3	5½	29·3	5½
Berks	5	18	10	28	25	10½	51·9	5½	32·8	8	32·8	8
Bucks	7	22	18	40	31	12½	34·2	8	21·1	4½	22·8	5
Herts	15	51	33	84	67½	12½	17·	3½	23·	6½	13·4	3
Huntingdonshire	8	30	13	43	38½	11½	30·5	6½	33·5	7	21·7	4½
Cambridgeshire	14	54	42	96	75	14½	26·1	5	41·	7½	32·	6
Bedfordshire	12	52	22	74	63	12	28·	5½	27·	5	28·5	5½
Rutland	3	28	14	36	35	11½	31·1	7½	44·	10	23·7	5½
Yorkshire	44	128½	101	229½	175½	12½	19·2	3½	40·8	10½	28·	7
England only*	370	.	.	2,120½	1,685½	.	.	.	.	.	.	.
Anglesey	4	9	8	17	13	18½	53·7	16½	40·	12½	36·	9½
North Wales	13	32	37	69	50½	14½	22·7	4	36·3	8½	45·	11½
South Wales	32	87	52	139	112½	15	20·	5½	21·6	6	10·2	3
Wales and Anglesey together	49	128	97	225	176	.	.	.	.	7½	.	6
Scotland	29	90½	43	133½	113½	12½	55·2	15	22·8	5½	15·4	4
Ireland	52	233	66	369	236	20·4	25·9	5½	21·2	4½	8·1	1½
Total*	500	.	.	2,757	2,211½	.	.	.	.	.	.	.

* The total weekly quantities and the frequency with which the different

LABOURERS in the COUNTIES of ENGLAND, and in WALES, SCOTLAND, and IRELAND.

Meat.		Milk.		Cheese.		Tea.		Value of Food.			Carbon.		Nitrogen.	
Per Family.	Per Adult.	Per Family.	Per Adult.	Per Family.	Per Adult.	Per Family.	Per Adult.	Per Family.		Per Adult.	Per Adult.	For 1s.	Per Adult.	For 1s.
oz.	oz.	pints.	fluid oz.	oz.	oz.	oz.	oz.	s.	d.	s. d.	grs.	grs.	grs.	grs.
86·7	22	11·4	58			2·	½	11	6	2 11½	36,190	12,144	1,444	480
51·3	11½	12·7	57½			1½	½	10	7½	2 4½	35,192	14,688	1,510	630
33·2	6½	2·6	10½	20½	4½	3·	·4	12	8½	2 7½	33,332	12,937	1,226	494
37·2	7½	3·	12	61½	12½	2½	½	13	6	2 9½	36,099	12,792	1,640	565
35·2	7	3·8	15½	24½	5	2·9	·55	13	4½	2 8	34,172	12,813	1,432	536
33·3	8	·2	½	30½	5½	2·	·4	15	9	3 0	42,876	14,148	1,797	600
29·1	17½	13·4	53	11·4	2½	2·8	·6	15	7	3 3	43,220	13,260	1,725	530
27·3	5½	10·6	49	1·3	·3	2·	½	13	6	3 1½	43,087	14,171	1,721	552
117·6	21	13·6	45	4·8	·8	2·	·35	10	9½	3 1½	38,759	12,396	1,627	520
92·	24	13·3	54	4·5	·9	2·1	·43	16	6½	3 4	44,183	13,254	1,640	492
77·1	17½	8·7	40	8·5	2·	1·3	·44	14	3½	3 4	39,907	12,000	1,680	504
53·6	12½	11·2	50·	13·6	3·	3·2	·7	15	6½	3 6	37,332	10,665	1,414	386
72·	13½	0·8	37½	9·	1½	2·5	½	17	1½	3 5½	38,386	11,029	1,526	438
122·8	35·	15·5	89	15·7	4	2·5	·7	15	5	4 4½	43,648	11,966	2,064	566
118·	29½	9·2	46½	7·	1½	3·2	·8	16	7½	4 1½	44,589	10,752	1,862	477
108 8	21½	30·2	120	11·2	2	5·2	1·0	18	10	3 9½	42,249	11,037	1,908	503
64·	19·	9·6	56½	29·	8½	3·	·9	12	7½	3 3½	43,326	13,032	1,918	588
94·	26½	14··	80	16·	4	2·5	·7	15	6½	4 6	41,356	9,100	1,740	383
73·	16½	3·5	16½	17·	4	2·2	½	12	3½	2 10	35,644	12,578	1,546	463
33·	8½	5·	25½	17·	4½	2··	·52	15	3½	4 2	47,537	11,418	1,732	415
130·	29½	4·	18	5·6	1½	2·4	·54	15	9½	3 6	40,507	11,572	1,550	443
33·2	7·	11·	40	3·5	1½	1·3	·25	11	2	2 0½	34,419	14,631	1,512	747
57·6	14·	5·5	26½	16·	4·	1·9	·45	18	9½	3 4½	47,004	13,845	1,744	512
22·6	6½	1·7	10	14·3	4	2·2	·64	9	1½	2 7½	37,381	14,052	1,477	557
62·6	19·	3·	18	30·3	9½	2·2	·7	13	0	4 0	42,669	10,652	1,585	391
50·2	12½	3·	12·7	25·8	5½	3·5	·8	13	1·	3 1½	41,425	13,255	1,631	532
85·3	26½	·35	2	26·	8½	3·1	·9	15	0½	4 1½	41,776	10,178	1,608	391
44·8	9½	2·	8½	16·	3½	2·2	·4	13	0½	2 8½	36,521	13,484	1,361	480
84·5	16·	5·3	20	9·8	1½	2·75	·5	16	1½	3 0½	35,651	11,588	1,322	424
70·4	17·	4·7	20½	8·	1½	2·8	·5	14	1	2 9½	37,059	13,176	1,193	423
80·	18½	3·	13½	2·	4·	2·	·48	13	6	3 1½	38,529	12,643	1,505	490
64·	14½	4·	18	6·8	1·5	1·7	·33	14	0	3 1½	37,094	12,000	1,750	514
96·	20·	5·	21½	7·2	1·5	2·6	·5	15	6½	3 2½	39,098	12,072	1,564	483
92·	17·	3·4	9	7·1	1·3	2·	·37	15	7	2 11½	41,117	13,866	1,598	540
105·	20	7·3	28	7·7	1·4	2·	·37	15	1	2 10½	38,099	12,251	1,614	520
76·	17½	6·1	28	6·2	1·5	3·	·7	13	6½	3 1	38,623	12,525	1,364	449
104·	20	15·1	74·7	None		2·4	·6	12	0	3 0	40,174	12,393	1,624	528
35·	10½	24·5	150½	None		3·75	1·0	14	4	4 4½	60,784	13,825	2,531	562
60·	15½	21·	178	7·1	1·8	3·8	·8	15	3	3 8·	45,613	12,439	1,765	498
26·	7½	11·7	66	40·	14·	1·5	·4	8	5½	2 3½	38,675	16,875	1,806	787
36·	10	15½	68			0·8	2·8½	·52	12	8	3 5½			
40·4	10½	24·4	124½	10·5	2½		1·25	·27	9	7½	3 3½	48,980	14,868	2348	716
21·2	4½	30·6	135						9	5½	1 9½	43,386	24,000	2,434	1,344

classes of food were eaten, are given in the table on the preceding page.

ABLE showing the frequency with which each ARTICLE OF FOOD WAS CONSUMED by with the NUMBER OF FAMILIES COMPREHENDED in each COUNTY and The * indicates that all the Families

COUNTY.	Number of Cases.	BREADSTUFFS.										Potatoes.	SUGAR.			FATS.			
		Bread.		Flour.		Oats.	Maize.	Barley.	Maslin.	Flour.	Rice.		Sugar.	Treacle.	One or Both.	Butter.	Dripping.	Suet.	One or ALL.
		Chiefly.	In part.	Chiefly.	In part.														
Cornwall	7	3	3	4	7	1	.	.	.	2	7	7	4	4	6	7*	4	2	7*
Devon	34	6	17	30	34*	3	.	.	.	13	27	28	13	31	32	31	11	17	33
Somerset	23	22	23*	1	16	.	.	.	.	1	9	20	16	16	22	22	9	8	23*
Dorset	19	6	10	9	18	.	.	.	.	1	5	15	18	4	18	18	6	12	19*
Wilts	17	9	13	8	15	.	.	.	.	1	12	6	15	11	16	17*	5	13	17*
Gloucestershire	9	.	4	9*	9*	1	.	.	.	.	1	9*	9*	7	9*	9*	3	6	9*
Worcestershire	7	.	1	7*	7*	1	.	.	.	1	2	7*	7*	4	7*	7*	5	.	7*
Salop	4	.	2	3*	3*	.	.	.	.	.	2	3	3*	1	3*	3*	1	.	3*
Lincolnshire	8	1	3	4	5*	4	.	.	.	1	4	5*	5*	4	5*	4	4	2	5*
Notts	7	2	3	5	7*	4	.	.	.	.	7	7*	7*	2	7*	6	4	3	7*
Leicestershire	3	1	6	8	9*	5	1	.	.	2	2	9*	9*	4	8	8	5	8	8*
Cheshire	8	.	2	5*	5*	1	.	.	.	.	2	4	5*	3	5*	5*	.	5	5*
Derbyshire	9	2	7	5	9*	1	6	.	.	3	1	9*	9*	4	9*	9*	5	7	9*
Northumberland	7	.	.	7*	7*	2	.	.	4	1	4	7*	7*	1	7*	7*	4	4	7*
Durham	4	.	.	4*	4*	2	.	.	.	1	3	4*	4*	3	4*	4*	4*	2	4*
Westmoreland	5	.	4	5*	5*	5*	.	.	.	2	4	5*	5*	2	5*	5*	4	2	5*
Cumberland	5	.	3	5*	5*	2	.	.	.	1	4	5*	5*	1	5*	5*	3	.	5*
Lancashire	2	.	.	2*	3*	1	.	.	.	.	2	3*	3*	1	3*	3*	.	1	3*
Staffordshire	9	3	6	7	9*	4	.	.	.	1	6	9*	9*	6	9*	9*	3	6	9*
Warwickshire	8	3	4	5	8*	4	.	.	.	2	6	8*	8*	5	8*	8*	3	6	8*
Northamptonshr.	10	8	9	2	10*	1	.	.	.	1	5	10*	10*	3	10*	9	5	7	9
Norfolk	7	.	4	7*	7*	1	.	.	.	.	2	10*	6	3	6	7*	2	3	7*
Suffolk	5	.	.	5*	5*	.	.	.	.	.	.	5*	5*	3	5*	5*	4	4	5*
Essex	6	3	.	3	6*	.	.	.	.	1	4	6*	6*	2	6*	6*	3	6*	6*
Kent	6	.	2	6*	6*	.	.	.	.	.	.	6*	6*	2	6*	6*	6*	6*	6*
Sussex	8	.	4	8*	8*	1	.	.	.	1	4	8*	8*	2	8*	8*	6	6	8*
Surrey	6	5	6*	.	6*	1	.	.	.	.	.	6*	6*	.	6*	6*	3	3	6*
Hants	3	3*	3*	.	3*	.	.	.	.	.	.	3*	3*	.	3*	3*	1	3	3*
Oxfordshire	11	9	10	1	11*	.	.	.	.	2	6	11*	11*	3	11*	11*	3	11*	11*
Berks	5	4	5*	1	3	1	.	.	.	.	.	4	5*	2	5*	5*	2	4	5*
Bucks	7	7*	7*	.	7*	.	.	.	.	.	.	7*	7*	3	7*	7*	3	6	7*
Hertfordshire	15	1	2	14	15*	.	.	.	.	6	6	12	15*	7	15*	15*	12	14	15*
Huntingdonshire	8	4	8*	4	8*	1	.	.	.	.	2	8*	8*	3	8*	8*	3	7	8*
Cambridgeshire	14	.	7	14*	14*	.	.	.	.	.	7	9	14*	4	14*	14*	12	6	14*
Beds	12	10	10	2	11	.	.	.	.	.	4	11	12*	6	12*	12*	5	11	12*
Rutland	8	6	6	2	8*	4	.	.	.	2	4	7	8*	6	8*	7	6	7	8*
Yorkshire	44	.	3	44*	44*	16	.	.	.	5	39	35	43	31	44*	43	39	17	43
ENGLAND	370	118	183	247	358	72	.	.	4	55	215	319	230	194	334	360	201	230	367
Per Cent.	100	30	50	69	90	20	.	.	1	15	58	87	62	52	93	97	54	62	99
Anglesey	4	.	2	4*	4*	4*	.	1	.	1	4*	4*	4*	2	4*	4*	.	.	4*
North Wales	13	.	2	13*	13*	8	.	.	2	8	13*	13*	13*	9	13*	13*	.	4	13*
South Wales	32	2	2	24	26	17	.	6	.	1	13	28	27	9	29	29	.	.	29
WALES	49	2	4	41	43	29	.	7	.	4	25	45	44	21	46	46	2	4	46
Per Cent.	.	4	8	83	87	60	.	13	.	8	51	91	90	40	92	92	4	8	92
SCOTLAND	29	.	10	3	19	29*	.	7	.	2	3	29*	28	6	28	27	.	.	27
Per Cent.	.	.	33	10	65	ALL.	.	24	.	6	10	ALL.	96	20	96	93	.	.	93
IRELAND	51	2	14	2	37	14	48	.	.	.	2	24 with Meal.	43	.	43	21	1	1	22
Per Cent.	.	3	26	3	69	26	91	.	.	.	3	44	82	.	82	40	2	2	42
TOTAL	269	122	211	293	437	144	48	14	4	61	245	.	345	.	481	454	204	235	462
Per Cent.	100	24	42	59	91	28	9	2	1	12	49	.	69	.	96	90	40	47	92

FARM LABOURERS in the COUNTIES of ENGLAND, and in WALES, SCOTLAND, and IRELAND DIVISION of the KINGDOM, and the TOTAL PER-CENTAGE RELATIONS.

embraced in the enquiry are included.

MEAT.				FISH.		MILK.									BEER.		
Bacon.	Meat.	Other.	Both.	Herrings.	Fish.	New.	Skimmed.	Butter.	One or All.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Ordinary.	Weak.	Cyder.
7*	6	7*	6	.	.	7*	.	.	7*	.	1	1	7*	.	1	.	5
27	18	34*	10	7	7	5	33	1	34*	.	2	5	34*	.	3	.	12
20	6	21	5	1	.	11	4	.	14	.	13	.	22	2	3	.	21
12	6	10*	1	.	.	10	2	.	12	.	18	.	18	2	1	1	7
15	3	16*	2	.	.	5	2	.	7	.	14	1	17*	7	5	.	.
9*	1	9*	1	.	.	.	1	.	1	.	.	.	9*	2	.	3	.
7*	5	7*	5	.	.	.	7*	.	7*	.	6	1	7*	3	4	3	.
3*	.	3*	.	.	.	.	2	2	2	.	1	.	3*	2	.	2	.
3	4	5*	2	1	.	.	4	4	4	.	2	3	5*	3	1	.	.
5	7*	7*	5	1	.	4	3	1	7*	.	3	4	7*	3	.	.	.
8	9*	9*	8	4	.	6	3	1	9*	.	3	5	9*	3	2	3	.
5*	3*	5*	.	.	.	3	.	3	3	3	3	1	5*	4	.	.	.
9*	9*	9*	9*	.	.	7*	3	.	9*	.	8	5	9*	5	2	2	.
7*	7*	7*	7*	.	.	6	4	1	7*	.	5	2	7*	7*	4*	.	.
4*	4*	4*	4*	1	.	3	.	1	3	.	4*	1	4*	4*	3	.	.
4	5*	5*	4	1	.	3	5	2	5*	.	4	1	5*	3	.	.	.
5*	1	5*	1	2	.	3	3	2	4	.	2	2	5*	3	2	.	.
1	3*	5*	1	.	.	3*	.	.	3*	.	1	.	3*	3*	.	.	.
6*	7	6*	6	.	.	3	4	.	6	.	3	.	6*	6	.	4	.
8*	8*	8*	8*	2	.	.	5	.	5	.	7	2	8*	5	3	2	.
6	10*	10*	6	.	.	.	10*	.	10*	.	4	4	10*	4	3	1	.
4	5	7*	2	1	.	2	4	.	6	.	5	.	7*	1	3	.	.
4	4	5*	3	3	.	1	3	.	4	.	3	.	5*	2	1	.	.
2	5	6*	1	2	.	1	1	.	2	.	5	1	6*	3	.	.	.
6*	6*	6*	6*	2	.	1	2	.	3	.	5	.	6*	1	4	.	.
5	6	8*	3	1	.	1	4	.	5	.	8*	.	8*	.	.	.	.
6*	6	6*	6	1	.	.	1	.	1	.	6*	1	6*	2	3	.	.
3*	2	3*	2	.	.	.	1	.	1	.	2*	.	3*	2	.	.	.
11*	6	11*	6	2	.	.	7	.	7	.	5	.	11*	5	5	1	.
5*	2	5*	5*	2	1	1	2	.	3	.	3	.	5*	2	3	.	.
1	7*	7*	1	2	.	1	6	.	6	.	5	1	7*	.	4	.	.
3	14	15*	2	4	.	1	11	.	11	.	11	4	15*	2	12	3	.
.	8*	8*	.	.	.	3	3	.	5	.	6	5	8*	3	4	.	.
8	11	14*	5	.	.	3	4	.	7	.	7	3	14*	7	9	.	.
4	11	12*	3	.	.	3	7	.	10	.	8	5	12*	7	12	.	.
4	3*	8*	3	.	.	3	4	.	7	.	8*	4	8*	6	2	1	.
37	33	43*	29	6	.	13	36	7	44*	.	1	33	44*	28	8	.	.
275	261	367	169	31	11	103	198	25	281	.	211	95	368	163	97	30	45
74	70	99	46	13	3	26	53	7	76	.	57	25	99	44	26	8	12
4*	2	4*	2	3	.	.	.	4*	4*	.	.	.	4*	2	.	.	.
13*	9	13*	9	6	.	3	7	13*	13*	2	7	3	13*	9	.	1	.
24	4	25	3	6	.	.	19	24	32*	2	29	.	27	10	.	.	.
41	15	42	14	14	.	3	26	41	49	2	36	3	44	21	.	1	.
83	30	84	30	30	.	6	56	83	100	4	72	6	90	49	.	.	.
10	18	21	7	11	7	11	19	13	29*	.	14	5	29*	8	.	.	.
33	62	72	24	37	24	67	65	44	ALL.	.	48	20	ALL.	27	.	.	.
22	11	31	2	17	.	13	29	23	31	.	.	11	31	13	.	.	.
42	21	50	3	31	.	22	55	44	98	.	.	21	57	24	.	.	.
348	305	461	192	93	18	129	272	102	410	2	254	114	472	205	97	31	45
69	60	92	38	18	3	25	54	2	82	½	50	22	94	41	19	6	9

Number.	County.	Parish.	Districts.	Number of Family. Above 10 years of Age.	Number of Family. Below 10 years of Age.	Number of Family. Estimated as Units.	Labourer taking Food at Home. Every Day.	Labourer taking Food at Home. Occasionally.	Labourer taking Food at Home. Not at all.	Rent. House and Garden. Yearly.	Rent. House and Garden. Weekly.	Rent. House and Garden. Abatement yearly.	Income. Labourer.	Income. Whole Family.	Occ. Dis. Fields.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Rice.	Peas.	Pulse.	All vegetables excepting as Salad.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All sweetened Articles.
		ENGLAND.																										

Butter.	Dripping or Lard.	Bread.	Meal and Flour.	Meat.	Milk.	Potatoes.	Rice.	Sago, Arrowroot, &c.	Suet.	Sugar.	Treacle.	Vegetables.	Value of Food.	Carbon. Total.	Carbon. Per Head.	Carbon. Per consumption Adult.	Nitrogen. Total.	Nitrogen. Per Head.	Nitrogen. Per consumption Adult.	Health.	Number.	Remarks.
SILK WEAVERS.																						
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			
12	1	1	1	1	1	1	1	1	1	1	1	1	0 14 7	105,240	21,397	31,220	7,256	1,695	2,519	Moderate.	1	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 10 10	85,693	-	16,457	4,855	-	972	One not well.	2	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 14 7	130,548	18,951	25,441	6,940	920	2,340	Cheerful.	3	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 14 10	123,612	-	21,405	5,132	-	1,278		4	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 15 10	130,710	21,208	31,000	5,618	925	1,346	Boy, but thin.	5	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 11 8	101,307	16,271	16,784	3,745	612	638	Ditto.	6	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 11	80,466	12,694	17,221	3,709	488	686	Pale, but well.	7	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 12 10	121,182	19,363	27,110	4,966	817	1,090	Good.	8	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 14 10	128,020	18,154	29,453	7,037	968	1,594	Husband not well.	9	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 14 11	101,241	-	20,040	6,646	-	1,778		10	
1	1	1	1	1	1	1	1	1	1	1	1	1	1 0 6	134,240	23,291	30,056	9,230	1,576	1,444	Good.	11	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 15 11	130,741	23,294	31,179	5,954	987	1,416	Moderate.	12	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 8 8	93,130	-	21,366	5,446	-	1,222	Good.	13	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 6	-	-	17,837	-	-	1,068	Not strong.	14	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 10	89,533	-	20,130	5,304	-	1,192	Ditto, thin.	15	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 6	87,603	-	15,446	3,998	-	893	Very pale.	16	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 10½	84,333	-	15,282	3,761	-	836	Very thin.	17	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 16 10½	109,221	24,574	27,054	7,729	854	1,721	Good.	18	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 6	128,832	21,472	31,854	5,365	877	1,341	Good.	19	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 9	143,862	23,943	35,976	6,972	1,159	1,698	Good.	20	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 6½	103,814	15,407	19,939	5,708	849	983	Wife not well.	21	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 3	130,901	19,737	34,948	5,408	735	1,803	Good.	22	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 15 8	156,533	19,734	35,923	11,002	1,304	1,973	Good.	23	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 7 6	109,614	14,658	21,923	4,549	621	869	Good.	24	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 5	147,264	18,414	21,040	6,616	854	966	Good.	25	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 6	113,223	16,467	23,050	5,610	715	1,005	Very good.	26	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 9	-	-	16,278	-	-	782	Good.	27	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 11	-	-	14,633	-	-	1,791	Good - -	28	Good case. Man. When full work.
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 6	-	-	15,724	-	-	1,178	Good - -	29	Good case. Woman. Full work.
1	1	1	1	1	1	1	1	1	1	1	1	1	0 10 3	123,119	20,503	25,231	6,296	844	929		30	
11	11	7	4	2	3	3	-	-	1	2	1	2	0 17 11	137,464	24,695	32,974	6,256	1,000	1,501	Good.	31	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 7	101,727	20,273	23,203	4,739	918	1,363	Not good.	32	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 4 6½	89,966	-	20,752	5,784	-	814	Moderate.	33	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 8 3	111,220	-	17,815	5,458	-	893	Wife ill.	34	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 6½	105,729	16,473	24,846	6,022	893	956	Feeble; ripe consumptive.	35	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 7 3	120,197	-	23,925	5,325	-	1,561	Wife not well.	36	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 11 7	124,379	20,063	29,459	7,864	974	1,560	Moderate; one consumptive.	37	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 3 9	132,345	16,543	19,724	4,559	652	761	Husband not well.	38	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 1	117,413	-	20,354	4,733	-	1,183	Good.	39	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 6 3	123,560	-	20,593	5,652	-	1,253	Good.	40	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 4 4	99,802	-	14,833	3,853	-	963	Moderate; thin.	41	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 9 4	126,182	18,026	25,236	5,399	770	1,542	Moderate -	42	Very respectable.
NEEDLEWOMEN.																						
-	-	-	-	-	-	-	-	-	-	-	-	-	0 3 10½	85,426	20,856	14,270	3,271	817	1,635		43	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 3 8	45,209	-	22,754	1,525	-	762		44	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 9½	78,778	13,130	23,79	3,534	589	765		45	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 4 10	59,468	14,867	16,980	3,272	818	649		46	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 3 3	-	-	20,000	-	-	1,481		47	
1	1	1	1	1	1	1	1	1	1	1	1	1	0 5 4½	72,969	14,594	20,851	3,647	729	871	Moderate.	48	

Number.	County.	Parish.	Entrants.	Number of Family.			Labourers taking Food at Home.			Rent.			Income.		Occ. Fin. Funds.															
				Above 20 years of Age.	Below 20 years of Age.	Reckoned as Adults.	Hours Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	Whole Family.		Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maize.	Peas.	Rice.	All purchased Articles as Diet.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All separate Articles.	
		ENGLAND—*continued.*														NEEDLEWOMEN—*continued.*													
40	Middlesex	St. George's, East	W.	-	-	-	—	-	-	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	-	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	
41		St. Giles	A. H.	2	-	2	—	-	-	-	0 2 6	-	-	0 7 6	-	6	12	1	-	-	-	-	-	21	3	11	2	-	2	
42		St. George's	H. B.	1	-	1	—	-	-	-	0 2 3	-	-	0 5 6	-	6	-	1	-	-	-	-	1	21	3	-	1	-	1	
43		Marylebone	G. C.	1	-	1	—	-	-	-	0 2 6	-	-	0 4 6	-	6	-	-	-	-	-	-	-	8	1	-	-	1	-	
44		St. Pancras	D.	1	-	1	—	-	-	-	0 2 6	-	-	0 4 10	-	4	-	-	-	-	-	-	-	4	-	1	1	-	1	
45		Ditto	E. F.	1	-	1	—	-	-	-	0 1 6	-	-	0 4 6	-	4	-	-	-	-	-	-	-	4	1	-	1	-	1	
46		Marylebone	J. L.	2	-	2	—	-	-	-	0 5 6	-	-	0 9 6	-	12	1	-	-	-	-	1	1	30	2	1	1	-	2	
47		Ditto	J. H.	1	-	1	—	-	-	-	0 2 6	-	-	0 5 6	-	11	-	-	-	-	-	-	-	4	2	-	1	-	1	
48		St. Mary's	M. H.	1	-	1	—	-	-	-	0 2 6	-	-	0 2 6	-	6	-	-	-	-	-	-	-	6	-	-	1	-	1	
49		St. Pancras	G.	1	-	1	—	-	-	-	0 2 6	-	-	0 4 6	-	6	1	-	-	-	-	-	-	42	3	1	-	-	-	
50		Ditto	F.	1	-	1	—	-	-	-	0 2 6	-	-	0 4 6	-	6	-	-	-	-	-	-	-	42	3	1	-	-	-	
51		St. Giles	M. P.	3	-	3	—	-	-	-	0 2 6	-	-	0 7 7	-	18	-	1	-	-	-	-	-	12	6	-	1	-	1	
52		St. James	H.	1	-	1	—	-	-	-	0 1 6	-	-	0 2 6	-	6	-	1	-	-	-	-	-	22	3	1	-	-	-	
53		Ditto	P.	1	-	1	—	-	-	-	0 1 9	-	-	0 3 6	-	3	14	-	-	-	-	-	-	22	3	1	-	-	-	
54		Whitechapel	T.	2	-	2	—	-	-	-	0 2 6	-	-	0 3 3	-	6	1	-	-	-	-	-	-	71	3	1	1	-	1	
55		St. Jude	E. W.	1	-	1	—	-	-	-	0 0 6	-	-	0 2 6	-	31	-	-	-	-	-	-	-	30	13	-	1	-	1	
56		Bethnal Green	W.	1	-	1	—	-	-	-	0 1 6	-	-	0 3 6	-	6	12	-	-	-	-	1	-	22	3	-	1	-	1	
57		Bishopsgate	E. H.	1	-	1	—	-	-	-	0 2 6	-	-	0 12 6	-	12	1	-	-	-	-	-	-	22	3	1	1	-	2	
58		Ditto	M. H.	1	-	1	—	-	-	-	0 2 6	-	-	0 5 6	-	6	-	-	-	-	-	-	-	22	3	-	1	-	1	
59		Ditto	S.	1	-	1	—	-	-	-	0 2 6	-	-	0 5 6	-	6	-	-	-	-	-	-	-	22	3	-	1	-	1	
60		Ditto	N. H.	1	-	1	—	-	-	-	0 2 6	-	-	0 5 6	-	6	-	-	-	-	-	-	-	22	3	-	1	-	1	
61		Ditto	S.	2	-	2	—	-	-	-	0 1 9	-	0 5 0	0 11 6	-	14	12	-	-	-	-	1	-	22	3	-	1	-	1	
62		Whitechapel	R. P.	1	-	1	—	-	-	-	0 1 6	-	-	0 2 3	-	4	12	-	-	-	-	-	1	22	3	1	1	-	1	
63		Spitalfields	S. C.	1	-	1	—	-	-	-	0 1 3	-	-	0 2 3	-	4	-	1	-	-	-	-	-	22	3	1	1	-	1	
64		Marylebone	S.	1	-	1	—	-	-	-	0 2 6	-	-	0 3 6	-	6	1	-	-	-	-	-	1	22	3	1	1	-	1	
																KID GLOVE MAKERS.													
71	Somerset	Yeovil	S.	1	-	1	—	-	-	Under Five	0 0 7	-	-	0 2 7	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
72		Ditto	W.	1	-	1	—	-	-	Five	0 1 0	-	-	0 3 0	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
73		Ditto	C. A.	1	-	1	—	-	-	Under Five	0 0 7	-	-	0 2 7	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
74		Ditto	F. A.	1	-	1	—	-	-	Five	0 1 0	-	-	0 3 0	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
75		Ditto	S.	1	-	1	—	-	-	Under Five	0 0 7	-	-	0 2 7	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
76		Ditto	S.	1	-	1	—	-	-	Five	0 1 0	-	-	0 3 0	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
77		Ditto	E.	1	-	1	—	-	-	Under Five	0 0 7	-	-	0 2 7	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
78		Ditto	S.	1	-	1	—	-	-	Five	0 1 0	-	-	0 3 0	-	12	-	-	-	-	-	-	-	22	3	-	1	-	1	
79		Ditto	M.	2	-	2	—	-	-	Under Five	0 0 7	-	0 15 0	0 15 7	-	14	12	-	-	-	-	1	-	22	3	-	1	-	1	
		ENGLAND.														STOCKING AND GLOVE WEAVERS.													
84	Derbyshire	Kilburn	N. M.	6	1	6½	—	-	-	-	0 2 9	-	0 0 0	1 1 9	-	-	28	-	-	-	-	1	1	18	3	11	2	-	2	
85		Ditto	S.	6	1	6½	—	-	-	4 15 0	-	-	0 0 0	1 1 9	-	-	28	-	-	-	-	1	1	18	3	11	2	-	2	
86		Coalbrook	A. F.	3	1	3½	—	-	-	-	0 2 9	-	0 0 0	1 1 9	-	4	28	-	-	-	-	1	1	18	3	11	2	-	2	
87		Ditto	W.	4	1	4½	—	-	-	3 15 0	-	-	0 0 0	1 1 9	-	-	28	-	-	-	-	1	1	18	3	11	2	-	2	

LOW-FED POPULATIONS—*continued.*

Foods.																							Calory.		Nitrogen.			Health.	Number.	Remarks.
Butter.	Dripping or Lard.	Suet.	Animal Fats.	Bacon.	Meat and Bone.	Meat only.	Sweet Meat.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 1d. or 1½d. per pint.	Cyder and Perry.	Value of Food.	Total.	Per Head.	Total.	Per Head.	Per consumer Adult.			
																						NEEDLEWOMEN—*continued.*								
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	lbs.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.			
1	+	-	8	15	-	-	15	-	-	-	+	-	-	-	-	-	1	-	-	-	-	0 1 3½	-	-	13,772	-	-	941	- - -	49	Aged.
1	2	1	2	1	-	15	2	3	2	1	-	-	1	-	1	2	2	2	1	-	-	0 4 8½	16,610	-	24,319	1,942	-	871		50	
1	+	-	1	-	-	1	1	2	-	-	-	-	-	-	-	-	12	-	11	-	-	0 2 11½	-	-	14,467	-	-	1,046	Moderate.	51	
1	+	-	-	-	-	1	-	-	24	-	-	-	-	-	-	-	1	-	1	-	-	0 4 2½	-	-	20,631	-	-	922		52	
1	2	+	1	-	-	2	-	-	1	-	-	-	1	-	-	-	2	-	-	1	-	0 2 4½	-	-	13,128	-	-	522		53	
1	+	+	1	-	-	2	1	1	-	-	-	-	-	-	-	-	2	-	-	1	-	0 2 3½	-	-	13,716	-	-	608		54	
2	1	1	3½	-	-	2½	2½	-	2	-	-	-	-	-	-	2	2	2	1	-	-	0 4 6½	47,700	-	57,368	1,805	-	917		55	
1	+	+	1	-	-	1½	1½	-	-	-	-	-	-	-	-	-	2	-	-	-	-	0 2 3½	-	-	18,082	-	-	869		56	
1	+	+	1	-	-	1	1	-	-	+	-	-	-	-	-	1	2	-	2	2½	-	0 2 3½	-	-	13,602	-	-	624		57	
1	1	+	1	-	1	2½	2½	-	-	1	-	-	1	-	-	-	1	2	1	-	-	0 2 1½	-	-	21,856	-	-	1,134		58	
1	1	+	1	-	-	1	1	4	-	-	-	-	-	-	-	2	2	-	4	-	-	0 2 3½	-	-	18,079	-	-	797		59	
1	2	-	1	-	-	1	2	4	-	-	-	-	-	-	-	2	1	2	-	-	-	0 1 2	50,101	-	50,501	2,347	-	755		60	
1	+	+	2	-	-	2	2	-	-	-	-	-	-	-	-	-	2½	-	2½	-	-	0 2 11½	-	-	15,227	-	-	702		61	
1	+	+	1	1	-	1	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	0 2 6½	-	-	30,241	-	-	1,247		62	
1	+	+	1	-	-	1	1	1	-	-	-	-	-	-	-	-	1½	-	-	-	-	0 2 4½	-	-	22,458	-	-	991		63	
½	+	+	½	-	-	1	1	-	-	-	-	-	-	-	-	-	2	1	-	-	-	0 1 11½	-	-	13,756	-	-	537	- - -	64	Has fits.
1	+	+	1	-	-	1½	1½	-	-	-	-	-	-	-	-	-	1½	-	-	-	-	0 3 6½	-	-	23,951	-	-	1,413		65	
1	+	+	1	-	-	1½	1½	-	-	-	-	-	-	-	-	-	2	-	-	-	-	0 3 0½	-	-	18,791	-	-	1,044	- - -	66	Good Workwoman.
1	+	+	1	-	-	1½	1½	-	-	-	-	-	-	-	-	-	2	-	-	-	-	0 3 7½	59,027	16,674	25,851	1,937	639	856		67	
½	+	+	½	-	-	1½	1½	-	-	-	-	-	-	-	-	-	2	-	-	-	-	0 2 10½	-	-	18,459	-	-	725		68	
½	+	+	½	-	-	1½	1½	-	-	-	-	-	-	-	-	-	2	1	-	-	-	0 2 6	-	-	17,997	-	-	844		69	
1	+	1	2	1½	-	-	1½	2	1½	1	-	-	1	-	-	-	2½	-	-	-	-	0 7 9½	62,815	-	54,523	2,558	-	1,209		70	
1	-	-	1	1	1	-	2	2	-	1½	-	-	1½	-	-	-	2½	2	-	-	-	0 3 0½	-	-	27,488	-	-	1,003		71	
1	-	1	1	1	1	-	1½	2	-	1½	-	-	1½	-	-	-	2	1	-	-	-	0 3 5	-	-	23,143	-	-	909		72	
1	-	-	1	1	-	1	1	-	-	1	-	-	1	-	-	1	2½	-	-	-	-	0 4 2	-	-	26,879	-	-	1,019		73	
																						KID GLOVE MAKERS.								
																						0 3 7½	45,036	-	47,329	2,979	-	1,667	Good.	74	
																						0 3 2½	-	-	21,811	-	-	1,691	Strumous.	75	
																						0 3 1	-	-	20,772	-	-	854	Not strong.	76	
																						0 3 4½	39,478	19,738	28,316	1,886	943	1,356	Do. feeby.	77	
																						0 3 5½	39,779	19,889	28,146	1,880	940	900	Moderate.	78	
																						0 14 2	100,332	33,540	52,554	2,924	1,005	1,008		79	
																						0 6 11½	74,077	-	74,078	2,719	-	988	Very pale	-	2 sisters respectable
																						0 9 10½	99,515	33,168	59,560	3,137	783	1,052	Good.	80	
																						0 2 10	-	-	21,260	-	-	1,296	Good.	81	
																						0 2 0½	-	-	21,501	-	-	1,291	Good.	82	
																						STOCKING AND GLOVE WEAVERS.								
1½	1	-	3½	2½	-	½	3½	-	-	2½	-	-	2½	1	-	-	4	1	-	-	-	1 5 7½	109,481	41,353	84,362	11,616	3,873	1,604	Good.	84	
1	-	1	2	1	-	-	1	-	-	1	-	-	1	-	-	-	2	-	-	-	-	0 6 1½	53,824	-	39,053	5,259	-	1,131	Good.	85	
1½	1	1	3½	1	½	-	2	-	-	2	-	-	2	1	-	-	3	1	-	-	-	0 12 7	207,834	51,973	93,110	8,354	913	1,668	Good.	86	
1	-	1	2½	1	½	-	2	-	-	2	-	-	2	1	-	-	3	1	-	-	-	0 10 11½	182,969	30,495	56,502	7,782	1,297	1,650	Good. Wife thin.	87	

X

Number.	County.	Parish.	Township.	Number of Family.			Labourers taking Food at home.			Rent.			Income.		Corn, Pigs, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Rice.	Arrowroot and Sago.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	Average Earnings.
				Above 16 Years of Age.	Below 16 Years of Age.	Employed on Arable.	Every Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment ground.	Labourer.	Whole Family.														
		ENGLAND—*continued.*														STOCKING AND GLOVE WEAVERS—*continued.*												
98	Derbyshire—*continued.*	Horsley		3	1	1										lbs. 7	lbs. 49	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
99		Horsley, Woodhouse		3	1	1										7	49											
100		Ditto	ditto	3	1	1										7	49											
101		Ditto	ditto	3	1	1										7	49											
102		Smalley		3	1	1										4	45											
103		Heanor		3	1	1										12	49											
104		Ditto		3	1	1										7	49											
105		Ditto		3	1	1										7	49											
106		Ditto		3	1	1										7	49											
107		Ilkeston		3	1	1										12	49											
108		Ditto		3	1	1										12	49											
109		Ditto		3	1	1										12	49											
110		Ditto		3	1	1										4	49											
111		Ditto		3	1	1										4	49											
112		Ditto		3	1	1										4	49											
																SHOEMAKERS (2nd and 3rd Class.)												
113	Northampton.	Northampton		3	1	1										12	7											
114		Ditto		3	1	1										12	7											
115		Ditto		3	1	1										12	7											
116		Ditto		3	1	1										12	7											
117		Ditto		3	1	1										12	7											
118		Ditto		3	1	1										12	7											
119		Ditto		3	1	1										12	7											
120		Ditto		3	1	1										12	7											
121	Stafford	Stafford		3	1	1										12	7											
122		Ditto		3	1	1										12	7											
123		Ditto		3	1	1										12	7											
124		Ditto		3	1	1										12	7											
125		Ditto		3	1	1										12	7											
126		Ditto		3	1	1										12	7											
127		Ditto		3	1	1										12	7											
128		Ditto		3	1	1										12	7											
																FARM LABOURERS.												
129	Cornwall	Saltash	T.	3	2	2				Over Rents 5 5 0			0 12 0			21	21											
130		Antony	E.	3	2	3							0 10 0			16	7											
131		Burraton	E.	3	2	3				0 5 0			0 11 0			7	21											
132		Oak Hill	D.	3	2	3							0 12 0			21	21											
133		Ditto	D.	3	2	3							0 12 0			21	21											
134		Bonton Fleming	C.	3	2	3							0 10 0			21	21											
135		Holland	P.	3	2	3							0 8 0			21	7											
136		Trebiston	K.	3	2	3				2 12 0			0 10 0			21	42½											

Foods.																							Value of Food.	Carbon.			Nitrogen.			Health.	Workers.	Remarks.
Butter.	Dripping or Lard.	Suet.	Accompanied Fats.	Bacon.	Meat and Bone.	Meat only.	Total Meat.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, wine, 1d. or 2d. per pint.	Cyder and Perry.		Total.	Per Head.	Per occupied Adult.	Total.	Per Head.	Per occupied Adult.			
STOCKING AND GLOVE WEAVERS—*continued.*																																
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	lbs.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			
																						6 9 8	97,658	30,532	36,662	4,092	1,340	1,608	Good.	91	
																						6 6 7	87,824	-	29,702	3,676	-	1,238	Good.	92	
																						6 16 9	290,488	28,928	83,666	8,469	1,213	3,493	Thin.	93	
																						9 19 6	213,237	28,965	33,112	8,459	1,067	1,321	Good. Depressed.	94	
																						6 14 6	244,374	27,149	34,900	8,240	1,027	1,321	Good.	95	
																						1 3 6	313,500	33,055	39,437	12,900	1,506	1,695	Good.	96	
																						6 12 6	117,024	19,504	30,004	4,240	623	1,000	Good.	97	
																						6 9 5	192,302	30,304	37,802	7,333	868	1,195	Husband not good.	98	
																						6 15 9	169,839	24,258	30,032	6,766	966	1,205	Moderate.	99	
																						9 9 11	132,146	23,951	30,032	5,309	953	1,244	Not very well.	97	
																						6 6 8	66,992	-	33,491	2,691	-	1,319	Good.	96	
																						6 18 10	200,801	19,079	33,344	8,176	745	998	Good.	99	
																						6 11 9	152,277	21,750	33,511	6,444	920	1,432	Good.	100	
																						9 12 6	164,940	20,242	27,500	6,730	842	1,148	Wife, and child not well.	101	
																						6 9 6	129,264	19,860	30,000	4,133	667	1,000	Good.	102	
																						6 9 8	125,042	20,840	27,787	5,340	891	1,188	Good.	103	
																						6 9 6	177,077	-	30,179	4,972	-	1,243	Good.	104	
SHOEMAKERS (2nd and 3rd Class.)																																
																						6 15 10½	146,736	-	36,839	6,018	-	1,504	Not very good. 2 consumptive.	105	
																						6 14 9½	103,796	25,964	34,142	7,291	1,841	2,355	Wife not good.	106	
																						6 14 4	144,796	30,663	33,177	6,139	955	1,272	Not very good.	107	
																						6 9 8½	80,852	23,466	31,287	2,502	966	1,287	Good.	108	
																						6 15 6½	109,696	27,307	36,409	6,008	1,215	1,733	Not very good.	109	
																						6 3 6½	-	-	36,787	-	-	1,193	Good.	110	
																						6 15 10½	161,656	46,417	55,695	6,164	1,241	2,655	Good - -	111	Dirty.
																						6 11 2½	102,873	23,853	31,809	4,203	853	1,218	Moderate.	112	
																						1 8 3½	270,999	28,789	33,653	33,003	1,302	1,479	Good - -	113	Clean.
																						6 12 3	189,790	27,448	36,597	4,558	1,139	1,519	Moderate.	114	
																						1 9 8½	284,919	32,202	40,274	11,397	1,457	1,842	Good.	115	
																						6 10 6½	114,691	20,672	29,530	4,079	1,169	1,669	Moderate.	116	
																						6 11 3½	89,253	20,452	34,190	3,992	1,207	1,536	Good.	117	
																						6 14 11½	116,391	-	39,997	4,960	-	1,250	Good.	118	
																						6 7 10½	75,991	12,216	18,325	3,000	501	872	Moderate.	119	
																						6 10 6½	143,940	25,140	35,844	5,816	926	1,336	Health not good.	120	
																						6 15 11½	137,971	22,995	27,594	5,999	999	1,197	Not good.	121	
																						6 12 8½	168,466	25,994	34,659	6,084	942	1,256	Not very good.	122	
																						6 12 6½	191,846	25,979	34,639	9,060	1,207	1,611	Wife not healthy looking.	123	
																						6 9 10½	113,916	18,986	28,479	4,840	774	1,161	Not good.	124	
																						6 12 3	197,343	-	30,804	4,277	-	1,069	Good.	125	
FARM LABOURERS.																																
																						6 9 2½	99,137	24,784	33,049	3,961	991	1,321	Ons not good.	126	
																						6 19 4½	215,455	37,959	53,144	9,971	1,099	1,937	Good - -	127	*Railway Labourer.*
																						6 9 6½	94,059	-	31,353	3,961	-	1,320	Good.	128	
																						6 9 6½	99,393	24,573	32,747	4,193	1,041	1,397	Good.	129	
																						6 14 3½	140,791	29,149	41,628	6,541	1,397	1,989	Good. -	130	
																						6 15 3	154,508	30,901	38,627	6,978	1,396	1,749	Good.	131	
																						6 9 6	118,134	-	39,378	5,413	-	1,471	Moderate.	132	
																						6 17 4½	207,807	18,894	25,979	8,818	72	1,983	Good.	133	

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

Number.	County.	Parish.	Initials.	Number of Family.			Labourer taking Food at home.			Rent.			Income.		Other Pig Feeds.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maizena.	Peas.	Rice.	All Farinaceous Articles reckoned as Bread.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All Saccharine Articles.
				Above 10 years of Age.	Below 10 years of Age.	Reckoned as Adults.	Every Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	Whole Family.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
154	Devon	Newton Ferrers	H.	4	4	6																						
155		Ditto	M.	3	4	5																						
156		Ditto		3	3	5																						
157		Plympton St. Mary	M.	3	3	3																						
158		Newton Ferrers	S.	2	1	2																						
159		Brixton	R.	3	3	5																						
160		Ditto		3	3	5																						
141		Tavistock	R.	3	1	4																						
142		Ditto		3	1	4																						
143		Ditto	E.	3	1	4																						
144		Lake	E.	3	4	4																						
145		Okehampton	S.	2																								
146		Ditto	J. R.	3																								
147		Ditto	E.	3																								
148		Ditto		4																								
149		Ditto	G.	4																								
150		Ditto		4																								
151		Fullgate	E.	3	4	4																						
152		Ditto		3																								
153		Hatherleigh	T.	3	3	5																						
154		Ditto		3																								
155		Merton	T.	2	3	3																						
156		Ditto		2																								
157		Ditto		2																								
158		Torrington	S.	2	3	3																						
159		Ditto		2																								
160		Ditto	H.	2																								
161		Ditto		2																								
162		Bideford	S.	2	4	3																						
163		Ditto		2																								
164		Ditto		2																								
165		Ditto		2																								
166		Ditto		2																								
167		Ditto	E.	2																								
168	Somerset	Preston near Yeovil	D.	2	1	2																						
169		Ditto	M.	2	2	3																						
170		Ditto		2																								
171		Yeovil Marsh	R.	4	3	5																						
172		Ditto	C.	4	1	5																						
173		Ditto	R.	4	3	5																						
174		Stapleharpe	R.	3	3	4																						
175		Hewleigh	F.	2	1	3																						
176		Ditto		2	1	3																						
177		Blagdon	G.	2	3	4																						
178		Pitminster	F.	4	4	6																						
179		Eastbrooke	D.	4	3	5																						
180		Highbridge	C.	3	4	5																						
181		Ditto		3	3	4																						
		Dulcott	G.	3	3	4																						

LOW-FED POPULATIONS—*continued.*

Food.																								Value of Food.	Carbon.			Nitrogen.			Health.	No. in Fam.	Remarks.
Butter.	Dripping or Lard.	Suet.	All separated Fats.	Beans.	Meat and Peas.	Meat only.	Total Meat.	Herrings.	Fish.	Rice Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 1d. or 1½d. per pint.	Cyder and Perry.				Total.	Per Head.	Per consumption Adults.	Total.	Per Head.	Per consumption Adults.			
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	pts.	pts.	pts.	pts.	pts.	pts.	lbs.	Nos.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grms.	grms.	grms.	grms.	grms.	grms.			
																						15	0 12 8	105,321	17,560	21,415	3,242	317	1,060		134	
																						12	0 12 6½	107,756	25,940	31,332	3,291	1,123	1,498	Good.	135	
																						12	0 13 9½	107,331	30,901	36,483	1,749	504	1,416		136	
																						12	0 7 10½	92,536	23,010	26,764	3,247	807	1,259	Very thin.	137	
																						12	0 9 6½	93,776	27,202	33,116	4,073	1,339	1,631	Good.	138	
																						12	0 9 6½	86,760	19,353	27,841	4,338	968	1,389	Good.	139	
																						12	0 14 9½	179,785	24,997	31,996	6,401	889	1,139	Thin.	140	
																							0 9 8½	144,600	26,925	31,125	6,231	1,246	1,557	Good.	141	
																							0 6 10½	101,944	25,981	29,777	6,253	1,413	1,694	Good.	142	
																							0 10 2½	109,351	23,758	32,471	6,291	1,098	1,598		143	
																							0 12 4	122,502	31,117	41,427	7,501	1,500	1,910		144	
																							0 7 6½	73,961	-	17,500	3,701	-	1,851	Good.	145	
																							0 10 7	148,031	24,594	33,759	6,745	1,541	1,874	- - -	146	Very good arrangement.
																							0 11 9½	138,336	27,242	34,677	9,801	1,931	1,451	Good.	147	
																							0 11 8	145,272	25,259	30,811	6,817	1,021	1,361	Bad. Scrofula.	148	
																							0 9 11	147,849	21,907	29,197	6,097	957	1,520	Moderate.	149	
																							0 8 6½	127,401	21,272	27,526	6,043	1,007	1,260	Good.	150	
																							0 13 11½	190,051	24,959	32,891	6,581	1,139	1,554	Good.	151	
																							0 8 2	101,056	-	26,345	3,274	-	1,756	Good.	152	
																						14	0 12 2½	174,766	14,565	19,344	6,247	893	821	Good.	153	
																						14	0 7 9½	99,504	23,342	31,370	3,647	962	1,071	Good.	154	
																							0 11 7	138,502	30,092	34,128	7,748	1,629	2,042	Good.	155	
																						12	0 9 2½	122,451	-	27,211	5,257	-	2,452	Good.	156	Very respectable.
																							0 9 1	123,597	30,921	41,228	6,499	1,625	1,625	Good.	157	
																						12	0 5 11	81,571	-	27,190	3,570	-	1,178	Good.	158	
																						12	0 14 10	231,249	27,745	40,218	10,672	1,334	1,941	Good.	159	
																						12	0 9 5½	130,398	19,013	30,270	5,432	906	1,086	Good.	160	
																							0 6 11½	125,402	24,702	30,893	5,922	1,863	1,972	Good.	161	
																							0 10 9	160,402	10,714	22,959	8,023	720	803	Good.	162	
																							0 11 7	142,731	-	30,943	6,944	-	2,892	Good.	163	
																							0 10 9½	175,994	24,001	30,259	6,307	1,051	1,973	Good.	164	
																							0 6 2½	97,514	-	30,972	3,253	-	1,972	Good.	165	Young. Good example.
																							0 11 2	166,502	21,502	27,248	5,979	1,417	1,859	Good.	166	
																							0 13 10	183,522	28,529	36,738	7,731	1,194	1,546	Good.	167	
																						12	0 11 6½	167,725	25,917	33,709	6,459	1,493	1,793	Good.	168	
																						12	0 12 5½	182,443	27,372	40,231	7,609	1,269	1,994	Good.	169	
																						12	0 12 9	144,899	24,098	32,242	5,037	862	1,255	Good.	170	
																						12	0 14 8½	254,853	33,536	42,780	9,619	1,274	1,646	Good.	171	
																						12	0 12 10½	171,484	19,845	23,164	7,934	992	1,444	Good.	172	
																						12	0 7 8	218,439	25,259	27,259	10,983	1,569	1,942	Not Good.	173	
																						24	0 13 10½	176,581	25,923	32,767	6,511	950	1,344	Good.	174	
																						24	0 11 8½	139,695	20,501	27,474	5,592	1,747	2,328	Good.	175	
																						24	0 10 7	209,917	25,924	32,995	9,209	1,075	1,825	One not good.	176	
																						24	0 11 9	151,739	25,301	34,201	7,229	1,054	1,809	Pale.	177	
																						24	0 13 4½	204,741	25,592	34,123	7,909	1,700	1,899	Good.	178	
																						36	0 17 6	166,350	23,769	30,292	6,667	963	1,592	Good.	179	
																						24	0 16 9	138,229	19,747	27,649	5,761	823	1,152	Moderate.	180	
																							0 11 3½	126,824	25,364	32,052	6,562	652	1,313	Good.	181	
																						24	0 14 4½	179,733	25,962	32,613	6,771	1,059	1,354	Good.	182	

FARM LABOURERS—*continued.*

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

Number.	County.	Parish.	Inmates.	Number of Family.			Labourers taking Food at home.			Rent.			Income.		Use, Fir, Tools.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Meslin.	Peas.	Rice.	All purchased articles as above.	Potatoes.	Green vegetables.	Sugar.	Treacle.	All purchased articles.
				Above 16 years of Age.	Below 16 years of Age.	Employed on Article.	Every day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	Whole Family.															
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.															
181	Somerset	Dulcott	F.	2	2	2				..	..	..	0 10 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
182		Wakeomble	C.P.	4	4	4				..	0 1 0	..	0 8 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
183		Ditto	C.P.	4	4	4				Free.	Free.	Free.	0 11 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
184		Ditto	C.P.	2	2	2				..	0 1 0	..	0 11 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
185		Woodford Lane	L.	7	3	3				..	0 1 0	1 acre 2 roods 0 poles	0 9 0	0 13 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
186		Ditto	L.	3	3	3				Over.	Over.	1 acre 2 roods 0 poles	0 9 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
187		Temple Cumbe	W.	2	4	4				2 12 0	0 1 0	..	0 9 0	0 13 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
188		Ditto	W.	4	4	4				2 12 0	..	..	0 9 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
189	Dorset	Bradpole	B.P.	4	4	4				..	..	..	0 10 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
190		Ditto	B.P.	4	4	4				..	..	..	0 10 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
191		Ditto	B.P.	4	4	4				..	..	..	0 10 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
192		Loders	B.C.	3	3	3				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
193		Ditto	B.C.	3	3	3				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
194		Ditto	B.C.	3	3	3				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
195		Askerswell	B.	4	2	2				Free.	Free.	..	0 9 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
196		Ditto	G.	4	2	2				..	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
197		Shipton	B.	3	3	3				Free.	Free.	..	0 9 0	1 1 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
198		Ditto	B.	6	3	3				..	..	..	0 9 0	1 1 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
199		Waddich	B.	3	3	4				..	0 2 0	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
200		Wyke	B.P.	3	3	3				7 0 0	..	..	0 11 0	0 13 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
201		Ditto	B.P.	3	3	3				7 0 0	..	..	0 11 0	0 13 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
202		Stratton	G.	2	2	2				Free.	Free.	..	0 9 0	..		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
203		Ditto	G.	4	4	4				Free.	Free.	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
204		Ditto	G.	4	4	4				Free.	Free.	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
205		Stafford Peverell	F.	3	3	3				..	..	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
206		Ditto	F.	3	3	3				Free.	Free.	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
207		Charminster	C.M.	4	4	4				Free.	Free.	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
208		Ditto	C.M.	4	4	4				Free.	Free.	Free.	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
209	Wilts	Hannington	W.	4	4	4				2 10 0	..	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
210		Ditto	W.	4	4	4				2 10 0	..	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
211		Sutton	C.M.	4	4	4				4 10 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
212		Ditto	C.M.	4	4	4				4 10 0	..	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
213		Ditto	C.M.	4	4	4				4 10 0	..	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
214		Norton Bavant	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
215		Ditto	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
216		Ditto	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
217		Heytesbury	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
218		Ditto	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
219		Ditto	W.	4	4	4				0 8 0	0 1 0	..	0 9 0	0 10 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
220		Stratford	B.	4	4	4				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
221		Avon Farm	B.	4	4	4				..	0 1 0	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
222		Woodford	B.P.	4	4	4				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
223		Ditto	B.P.	4	4	4				..	..	..	0 9 0	0 11 0		Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.	Dit.
												21 parish allotments																	

LOW-FED POPULATIONS—*continued.*

FOODS.																								CARBON.			NITROGEN.			HEALTH.	NUMBER.	REMARKS.
Butter.	Dripping or Lard.	Suet.	ALTOGETHER FATS.	Bacon.	Meat and Bone.	Meat only.	TOTAL MEAT.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	ALL MILK.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, M. at 1d. per gall.	Cyder and Perry.	Value of Food.	Total.	Per Head.	Per consumer Adult.	Total.	Per Head.	Per consumer Adult.			
FARM LABOURERS—*continued.*																															
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	No.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.			
1	-	-	¼	-	-	-	-	-	-	24	-	-	24	-	1	-	2	-	-	-	24	0 10 11	190,473	26,619	35,091	3,946	902	1,186	Good.	185	
½	-	-	½	½	-	-	½	-	-	1	-	-	1	-	-	-	2	-	-	-	29	0 13 9½	130,716	19,959	27,245	3,282	784	1,068	Not good.	184	
½	-	-	½	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	25	0 8 2½	93,841	16,303	20,400	2,405	699	851	Good.	182	
½	-	-	½	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	0 8 2½	92,408	17,406	19,994	2,770	1,259	1,734	Ill	186	
1	-	-	1	-	-	-	-	-	-	1	-	-	1	-	-	-	1	-	-	-	18	0 10 9½	318,907	53,330	57,440	13,865	1,599	1,439	Good.	187	Dirty, wretched.
-	½	-	½	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	18	0 9 11	139,464	16,193	27,324	4,168	821	732	Not good.	188	
½	½	-	1	-	½	-	½	-	-	-	-	-	-	-	3	-	4	-	-	-	12	0 13 9½	113,906	-	27,253	4,016	-	1,638	Good.	189	
½	½	-	1	-	½	-	½	-	-	-	-	-	-	-	3	-	4	-	-	-	12	0 11 10½	142,765	23,794	33,476	6,855	1,950	1,584	Good.	190	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	15	0 14 8½	198,135	26,976	31,556	6,671	1,336	1,449	Good.	191	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	12	0 12 1	196,552	28,651	33,700	9,655	1,256	1,378	Pale.	192	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	13	0 11 3	149,600	20,127	28,178	6,977	900	1,255	Pale.	193	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	-	0 11 9½	178,015	22,256	32,365	7,256	917	1,331	Pale & unhealthy.	194	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	-	0 11 9½	203,227	25,403	33,871	10,017	1,252	1,670	Good	195	Railway labourer.
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	5	2	-	-	12	0 10 3	167,618	24,879	32,826	5,846	1,669	1,982	Dull.	196	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	12	0 9 10	65,166	13,778	21,695	3,134	783	1,044	Moderate.	197	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3	-	4	-	-	½	-	0 11 5	159,915	21,691	29,817	9,162	1,526	1,656	Moderate.	198	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	12	0 6 9½	71,148	-	23,572	3,173	-	1,587	Not good - -	199	Wretched.
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	12	0 13 9½	255,254	8,508	28,195	11,817	1,974	1,478	Good.	200	
1	½	-	1½	½	-	-	½	-	-	½	-	-	½	-	4	-	3	-	-	-	-	0 9 7½	126,052	20,003	28,772	5,817	969	1,293	Husband, not good.	201	
½	½	½	1½	½	½	-	1	-	-	½	-	-	½	-	3	-	3	1	-	-	-	1 3 4½	229,218	29,958	43,346	10,666	1,394	1,931	Wife, not good.	202	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3	-	3	1	-	-	-	1 0 9½	209,142	25,357	34,470	9,242	1,374	1,832	Good.	203	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 13 4	134,995	23,754	29,599	5,991	1,495	1,977	Good.	204	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 12 6½	233,190	-	38,198	11,194	-	1,866	Moderate - - -	205	Rather fat.
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 7 6½	97,734	22,577	30,692	4,520	1,510	1,952	Wife, not good.	206	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	-	0 7 9½	112,177	25,453	39,478	4,612	922	1,316	Good - -	207	Very clean and neat.
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	-	0 14 11	253,671	33,248	46,467	11,944	1,699	2,133	Wife, not good.	208	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 3	221,518	27,707	34,650	9,013	1,127	1,502	Good.	209	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 10 3	262,370	33,014	40,800	13,099	1,554	1,961	Good.	210	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	-	0 14 11	186,172	25,871	36,936	7,771	971	1,110	Good.	211	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	3½	-	3	-	-	-	-	0 7 11	107,553	15,362	23,080	4,602	669	1,075	Pale.	212	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 8 11	132,709	16,589	29,709	6,124	932	1,449	Good.	213	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	1 7 7½	201,443	30,144	35,405	12,580	1,258	1,572	Good.	214	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	1 1 1½	241,959	-	39,216	10,199	-	1,275	Good.	215	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 8 8½	163,383	26,141	33,171	4,693	1,121	1,494	Good.	216	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 10 9½	179,558	19,950	26,599	6,562	781	1,014	Good.	217	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 7 5½	93,130	17,098	24,324	3,450	660	900	Moderate.	218	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 9 9½	147,286	21,032	28,700	6,656	975	1,241	Not good.	219	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 10 11	179,574	25,596	33,514	5,212	808	1,203	Good.	220	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 11 0	154,029	19,253	29,114	6,005	625	1,200	Good.	221	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 8½	159,522	27,964	38,962	6,197	1,271	1,844	Good.	222	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 10	210,825	26,353	33,132	6,602	1,003	1,447	Not good.	223	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 2½	149,250	-	30,410	6,005	-	2,001	Good.	224	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 8½	209,302	29,900	46,142	8,132	1,162	1,807	Good.	225	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 19 0	224,453	28,244	38,970	8,980	1,260	1,810	Good.	226	
½	½	-	1	½	-	-	½	-	-	½	-	-	½	-	4	-	4	-	-	-	-	0 14 10½	182,750	25,036	33,210	6,206	1,149	1,599	Good.	227	

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

Number.	County.	Parish.	Initials.	Number of Family.			Labourers taking Food at home.			Rent.			Income.		Gen. Pig. Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Rice.	All articles specified as Retail.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All articles specified as Groceries.
				Above 15 years of Age.	Below 15 years of Age.	Reckoned as Adults.	Every Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Abstracted yearly.	Labourer.	Whole Family.															
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
228	Gloucestershire.	Wapley	L.	6	1	6				..		Pr. perch 17 2	0 11 6	1 5 9		8	40							22	18		2	24
229		Ditto	T.	3	0	3				3 0 0	..	Pr. perch 17 2	0 10 3	..			12	3					1	21	11	11	3	21
230		Wolferleigh	H.	3	3	6				4 0 0	..	0 18 0	0 13 6	..			32							24	13	2		8
231		Ditto	H.	3	3	6				4 0 0	..	0 18 0	0 12 9	0 13 6		3	45							22	18	2		8
232		Rosseworthy	T.	2	.	2				2 10 0	..	..	0 16 0	..			20							9	6	14	1	1	7
233		Iron Acton	R.	4	3	7				3 0 0	..	1 acre 19 6	0 10 0	..			44							40	16	16	3	1	12
234		Ditto	A.	3	4	7				3 0 0	..	1 acre 19 6	0 12 0	1 5 0			28							113	24	20½	1	1	8
235		Hest	R.	3	6	8				2 10 0	..	15 perch 2 0 0	0 16 0	0 15 0		16	40							80	16	22	2	1	8
236		Yate	R.	3	4	5				6 0 0	..	..	0 12 0	0 14 6			40							34	24	9	1	1	8
237	Worcestershire.	Abenhurch	S.	3	6	6				..	0 1 10	Large. 0 7 6	0 13 6	..			42							67	24		1½	1	11
238		Ditto	M.	2	4	4				..	..	..	0 15 0	..			42							67	24		1½	1	11
239		Ditto	S.	2	4	4				..	0 1 3	..	0 14 6	..			42							67	24		1½	1	11
240		Ditto	W.	2	4	4				..	..	..	0 13 6	..			42							67	24		1½	1	11
241		Ditto	S.	2	4	4				..	..	..	0 13 6	0 14 6			42							67	24		1½	1	11
242		Ditto	P.	2	4	4				..	0 1 11	..	0 13 6	0 15 0			42							67	24		1½	1	11
243		Ditto	P.	2	4	4				..	0 1 6	..	0 13 6	0 15 0			42							67	24		1½	1	11
244	Salop	Oswestry	D.	2	4	4				0 1 5	..	..	0 12 6	..		12	40							80	22	22	1½	1	11
245		Ditto Gronwen	W.	2	4	4				2 0 0	..	..	0 12 6	..			40							80	22	22	1½	1	11
246		Old Xnut	W.	3	4	5				4 10 0	..	..	0 12 9	1 0 0		4	30						12	24	8	8	2	1	8
247	Leicestershire.	Mantlarye	D.	3	3	6				3 12 0	..	..	0 15 0	1 0 0		14	32						1	22	22	22	2	1	8
248		Ditto	.	3	3	6				4 0 0	..	..	0 13 0	..			32							22	22	22	2	1	8
249		Great Gumley	.	3	3	6				4 7 0	..	..	0 12 0	..			32							22	22	22	2	1	8
250		Ditto	.	3	3	6				4 0 0	..	..	0 12 0	..			32							22	22	22	2	1	8
251		Ditto	G.	3	3	6				3 0 0	..	0 5 0	0 12 0	1 0 0			32							22	22	22	2	1	8
252	Nottinghamshire.	Arnold	G.	3	3	6				..	0 3 0	..	0 13 0	1 10 0		112	24	2					1	22	22	22	2	1	8
253		Ditto	G. A.	3	3	6				Free	..	..	0 14 0	..			24	2						22	22	22	2	1	8
254		Sutton	A.	3	4	5				Free	..	..	0 10 0	..		60	30						1	22	22	22	2	1	8
255		Wilford	W.	4	.	4				6 0 0	..	..	0 12 0	0 14 0	F. P.		42							22	22	22	2	1	8
256		Ditto	S.	3	2	4				6 0 0	..	0 6 0 1 rood.	0 12 0	0 12 0			24	1					2	22	22	22	2	1	8
257		Clifton	R.	3	3	6				6 0 0	..	..	0 14 0	1 1 6	F.		32						1	22	22	22	2	1	8
258		Ditto	R.	3	3	6				6 0 0	..	..	0 12 0	..	F.	5	32						1	22	22	22	2	1	8
259	Leicestershire.	Kegworth	.	3	.	3				4 0 0	..	1a. 6d. 100 sq. yds	0 12 0	0 12 0		4	20	1					1	22	22	22	2	1	8
260		Ditto	B. E.	3	3	6				..	0 1 3	2a. 6d. 100 sq. yds	0 12 0	..			24							22	22	22	2	1	8
261		Ditto	.	3	3	6				4 10 0	..	..	0 12 0	0 17 0			24							22	22	22	2	1	8
262		Ditto	B.	3	3	6				..	0 1 3	..	0 12 0	0 12 0		4	24	1					1	22	22	22	2	1	8
263		Ditto	.	3	3	6				..	0 1 3	..	0 12 0	0 17 0		4	30	1					1	22	22	22	2	1	8
264		Ditto	R.	4	3	7				..	0 1 3	Free	0 12 0	0 12 0		40	7					3	1	22	22	22	2	1	8
265		Lockington	F.	2	3	5				3 0 0 and land	..	Free	0 12 0	..		2	24	1					1	22	22	22	2	1	8
266		Ditto	R.	3	1	5				3 0 0 and land	..	..	0 12 0	..		2	24							22	22	22	2	1	8
267		Ditto	.	3	4	5				3 0 0 and land	..	..	0 13 6	0 14 6			42						1	22	22	22	2	1	8
268	Cheshire	Bramall	.	3	3	6				6 0 0	..	..	0 13 0	1 4 0		4	42							22	22	22	2	1	8
269		Bramall Green	F.	3	3	6				6 10 0	..	..	0 14 0	1 4 0		8	30		2					22	22	22	2	1	8
270		Gawsworth	M.	3	3	6				..	..	..	..	..		8	42		2					22	22	22	2	1	8
271		Peckhill	D.	3	3	6				6 0 0	..	..	0 13 0	0 12 0			30							22	22	22	2	1	8
272		Ditto	.	3	3	6				6 0 0	..	..	0 13 0	..			30							22	22	22	2	1	8
273		Ditto	.	3	3	6				6 10 0	..	..	0 14 0	..			30							22	22	22	2	1	8

LOW-FED POPULATIONS—*continued.*

Food.																								Carbon.			Nitrogen.			Health.	Stones.	Remarks.
Butter.	Dripping or Lard.	Suet.	All separated Fats.	Bacon.	Meat and Bone.	Meat only.	Total Meat.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 3d. per Gall.	Cyder and Perry.	Value of Food.	Total.	Per Head.	Per Equated Adults.	Total.	Per Head.	Per Equated Adults.			
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	No.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

Numbers.	County.	Parish.	Initials.	Number of Family. Above 10 years of Age.	Number of Family. Below 10 years of Age.	Number of Family. Employed in Agriculture.	Labourer taking Food at Home. Every Day.	Labourer taking Food at Home. Sundays only.	Labourer taking Food at Home. Not at all.	Rent. House and Garden. Yearly.	Rent. House and Garden. Weekly.	Rent. Allotment, yearly.	Income. Labourer.	Income. Whole Family.	Cow, Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Rice.	All Vegetables (Potatoes as Bread).	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All Vegetables (Potatoes).
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
77	Derbyshire	Smalley	E.	2	3	1½				--	0 3 6	--	0 14 0	0 14 0		4	21½	3						2	32	10		2	6	21
78		Stanley	W.	4	3	2½				--	0 3 6	--	0 13 0	1 3 6		8	35							4	44	11		2		21
79		Ditto	E.	4	3	2½				Own	Own	--	0 13 0	1 15 6			35	1						4	44	11		2		21
80		Wilsthorpe	P.	4	3	2½				3 12 6	--	--	0 13 0	--		8	35							4	44	11		2	6	21
81		Breaston	T. K.	4	3	1				--	0 1 6	--	0 12 0	1 0 6			40							4	44	11		2		21
82		Dunscott	J.	4	1	1½				Own	Own	--	0 13 0	1 3 6			35	1						4	44	11	2	2		21
83		Ditto	J.	4	1	1½				Own no waste.	Own no waste.	0 1 6	0 13 0	1 15 6		8	35					2		4	44	11		2	6	21
84		Ditto	C.	4	1	2½				--	0 1 6	--	0 13 0	0 19 3		12	1	1						4	44	11		2		21
85		Ditto	D.	4	1	2½				Own	Own	--	0 13 0	0 17 0			35	1						4	44	11		2		21
86	Northumberland.	Haydon Bridge		2	1	1½				Free	Free	--	0 14 0	--			35							4	44	14		2		21
87		Ditto		2	2	4				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
88		Ditto		2	4	5				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
89		Ditto		2	2	3				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
90		Ditto	W.	2	2	3				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
91		Harnon	C.	2	4	4				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
92		Hartley South Farm	S.	2	-	3				Free	Free	--	0 15 0	--			35					2		4	44	21		2		21
93	Durham	Cockerton		2	2	4				--	--	--	0 13 0	--			35							4	44	21		2		21
94		Ditto		2	2	2				--	--	--	0 13 0	--			35							4	44	21		2		21
95		Ditto		2	2	2				--	--	1 0 0	0 13 0	--			35							4	44	21		2		21
96		Ditto	K.	2	2	2				--	0 1 3	--	0 13 0	1 13 6			35							4	44	21		2		21
97	Westmoreland.	Barton		4	4	4				0 15 6	--	--	--	--			35							4	44	21		2		21
98		Ditto	E.	4	3	-				0 16 6	--	--	--	--			35	14						4	44	21		2		21
99		Clifton	W.	2	2	1				2 0 6	--	--	0 14 0	--			35	7						4	44	21		2		21
100		Highthorpe	E.	2	3	1½				1 15 6	--	--	0 14 0	--			35					1		4	44	21		2		21
101		Lowther	H.	2	6	3				1 19 6	--	--	--	--			35	14				Rice 14		4	44	21		2		21
102																	35	7							280	7		7		21
103	Cumberland.	Blackwell	T.	4	4	2				2 0 0	--	--	0 13 0	0 14 0		12	35					2		4	44	21		2		21
104		Ditto	W.	1	1	1½				2 0 0	--	--	--	--			35							4	44	21		2		21
105		Ditto	E.	3	-	2				4 0 0	--	1	0 4 0 and fuel.	--			35	14						4	44	21		2		21
106		Dunlon	T.	3	3	1½				4 17 6	--	--	0 13 0	--		4	35	14						4	44	21		2	3	21
107																	35	7							280	7		7		21
108	Lancashire	Whittington	T.	3	3	1½				2 0 0	--	--	0 13 0	1 3 6			35							4	44	21		2		21
109		Ditto	T.	4	-	1				2 0 0	--	--	0 13 0	--			35	7						4	44	21		2		21
110		Ditto		4	-	1				2 0 0	--	--	0 14 0	--			35							4	44	21		2		21
111	Staffordshire.	Wigginton		4	3	2½				2 0 0	--	0 10 0	0 13 0	0 16 0			35							4	44	21		2		21
112		Ditto		4	3	2½				2 0 0	--	--	0 13 0	0 16 0			35	7						4	44	21		2		21
113		Ditto		4	3	2½				Free	--	--	0 13 0	0 16 0			35							4	44	21		2		21
114		Ditto		4	3	2½				2 0 0	0 1 3	0 10 0	0 13 0	0 16 0			35	7						4	44	21		2		21
115		Hyde Lea		2	2	2				2 0 0	--	--	0 13 0	0 14 0			35							4	44	21		2		21
116		Ditto		2	2	2				2 0 0	--	--	0 13 0	--			35							4	44	21		2		21
117		Ditto		2	2	2				2 0 0	0 1 3	--	0 13 0	--			35							4	44	21		2		21
118		Ditto		2	2	2				2 0 0	--	--	0 13 0	0 14 0			35							4	44	21		2		21
119		Rickerscote	C.	2	-	2				2 0 0	--	--	0 13 0	--		14	35							4	44	21		2		21

ow-fed Populations—*continued.*

| Food. | | |

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

No.	County.	Parish.	District.	Number of Family. Above 10 Years of Age.	Below 10 Years of Age.	Reckoned as Adults.	Labourer taking Food at Home. Every Day.	Sundays only.	Not at all.	Rent. House and Garden. Yearly.	Weekly.	Allotment yearly.	Income. Labourer.	Whole Family.	One, Pig, Fowl or
114	Warwick-shire.	Meriden	H.	2	.	2				£ s. d. 0 10 0 Land.	£ s. d. ..	£ s. d. ..	£ s. d. 0 14 0	£ s. d. ..	P. C.
117		Ditto		2	1	2½				0 10 0	..	0 12 0	0 13 0	0 13 0	.
118		Allesley		2	2	3				3 10 0	..	..	0 11 6	0 12 0	P.
119		Ditto		4	1	4½				4 10 0	..	..	0 11 6	0 12 0	P.
120		Easton Green		2	1	2½				4 10 0	..	..	0 13 0	..	P.
121		Easton Green		2	.	2				2 1 0	..	..	0 12 0	1 3 0	P.
122		Stoneleigh		2	2	3				2 6 0	..	..	0 12 0	..	P.
123		Ditto		2	3	3½				2 6 0	..	..	0 12 0	..	P.
124	Northamp-tonshire.	Ilsworth		2	.	2				3 0 0	..	..	0 10 0	0 11 0	.
125		Ditto		2	.	2				2 10 0	..	..	0 12 0	0 13 0	.
126		Ditto		2	.	2				2 12 0	..	0 7 0	0 12 0	1 4 0	.
127		Weston Favell		2	1	2½				3 0 0	..	..	0 12 0	..	.
128		Ditto		2	1	2½				3 10 0	..	..	0 12 0	0 13 0	.
129		Ditto		2	1	2½				3 10 0	..	..	0 12 0	1 0 0	P.
130		Nethercote		2	2	3				..	0 1 6	1 15 0	0 11 6	..	.
131		Ditto		2	2	3				..	0 1 6	1 15 0	0 11 6	..	.
132	Norfolk	Diss		2	2	3				4 0 0	..	..	0 9 6	0 11 0	.
133		Ditto		2	2	3				4 0 0	..	..	0 9 6	0 11 0	.
134		Ditto		2	2	3				4 0 0	..	..	0 9 6	0 11 0	.
135		Eaton near Norwich		2	2	3				4 4 0	..	..	0 10 0	0 12 0	.
136		Ditto		2	2	3				4 4 0	..	..	0 10 0	0 12 0	.
137		Ditto		2	2	3				4 4 0	..	..	0 10 0	0 12 0	.
138		Ditto		2	2	3				4 4 0	..	..	0 10 0	0 12 0	.
139	Suffolk	Culford		2	2	3				..	0 1 6	..	0 11 6	..	.
140		Fornham St. Martin		2	2	3				..	0 1 6	..	0 10 0	0 11 0	.
141		Ditto		2	1	2½				2 0 0	..	..	0 9 6	..	.
142		Ditto		2	1	2½				2 0 0	..	..	0 10 0	..	.
143		Bury St. Edmunds		1	2	2				..	0 2 6	..	0 12 0	0 13 0	.
144	Essex	Chelmsford		2	1	2½				..	0 1 6	..	0 11 6	..	.
145		Ditto		2	1	2½				..	0 1 6	..	0 11 6	..	.
146		Writtle		2	1	2½				2 0 0	..	..	0 10 0	..	.
147		Ditto		2	1	2½				2 0 0	..	..	0 10 0	..	.
148		Broomfield		2	2	3				3 0 0	..	..	0 11 6	..	.
149		Ditto		2	2	3				3 0 0	..	..	0 10 0	..	.
150	Kent	Tunbridge		2	2	3				..	0 2 6	..	0 11 6	..	.
151		Ditto		2	2	3				..	0 2 6	..	0 11 6	..	.
152		Ditto		2	2	3				..	0 2 6	..	0 11 6	..	.
153		Ditto		2	2	3				..	0 2 6	..	0 11 6	..	.
154		Ditto		2	2	3				..	0 2 6	..	0 11 6	0 12 0	.
155	Sussex	Burpham		2	2	3				..	0 2 6	..	0 11 6	..	.
156		Ditto		2	2	3				..	0 2 6	..	0 11 6	0 13 0	.
157		Star Row		2	1	2½				..	0 2 6	..	0 12 0	..	.
158		Highfield		2	2	3				Free	Free	..	0 12 0	..	V
		Ditto		2	2	3				..	0 1 6	..	0 12 0	..	.

No.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Rice.	Arrowroot, Sago or Tapioca.	Potatoes.	Onions & Vegetables.	Sugar.	Treacle.	Lb. Treacle Pudding.
114	lbs. 16	lbs. 32	lbs. .	lbs. .	lbs. .	lbs. .	lbs. .	lbs. .	lbs. .	lbs. 20	lbs. .	oz. .	oz. .	lbs. .
117	16	32	.	.	.	.	.	1	.	20	.	4	1	2
118	16	32	.	.	.	.	.	.	.	20	.	4	.	2
119	16	32	.	.	.	.	.	.	.	20	.	4	4	2
120	16	32	.	.	.	.	.	.	.	20	.	4	.	2
121	16	32	.	.	.	.	.	.	.	20	.	4	.	2
122	16	32	.	.	.	.	.	.	.	20	.	4	.	2
123	16	32	.	.	.	.	.	.	.	20	.	4	.	2
124	16	32	.	.	.	.	.	.	.	20	.	4	.	2
125	16	32	.	.	.	.	.	.	.	20	.	4	.	2
126	16	32	.	.	.	.	.	.	.	20	.	4	.	2
127	16	32	.	.	.	.	.	.	.	20	.	4	.	2
128	16	32	.	.	.	.	.	.	.	20	.	4	.	2
129	16	32	.	.	.	.	.	.	.	20	.	4	.	2
130	16	32	.	.	.	.	.	.	.	20	.	4	.	2
131	16	32	.	.	.	.	.	.	.	20	.	4	.	2
132	16	32	.	.	.	.	.	.	.	20	.	4	.	2
133	16	32	.	.	.	.	.	.	.	20	.	4	.	2
134	16	32	.	.	.	.	.	.	.	20	.	4	.	2
135	16	32	.	.	.	.	.	.	.	20	.	4	.	2
136	16	32	.	.	.	.	.	.	.	20	.	4	.	2
137	16	32	.	.	.	.	.	.	.	20	.	4	.	2
138	16	32	.	.	.	.	.	.	.	20	.	4	.	2
139	16	32	.	.	.	.	.	.	.	20	.	4	.	2
140	16	32	.	.	.	.	.	.	.	20	.	4	.	2
141	16	32	.	.	.	.	.	.	.	20	.	4	.	2
142	16	32	.	.	.	.	.	.	.	20	.	4	.	2
143	16	32	.	.	.	.	.	.	.	20	.	4	.	2
144	16	32	.	.	.	.	.	.	.	20	.	4	.	2
145	16	32	.	.	.	.	.	.	.	20	.	4	.	2
146	16	32	.	.	.	.	.	.	.	20	.	4	.	2
147	16	32	.	.	.	.	.	.	.	20	.	4	.	2
148	16	32	.	.	.	.	.	.	.	20	.	4	.	2
149	16	32	.	.	.	.	.	.	.	20	.	4	.	2
150	16	32	.	.	.	.	.	.	.	20	.	4	.	2
151	16	32	.	.	.	.	.	.	.	20	.	4	.	2
152	16	32	.	.	.	.	.	.	.	20	.	4	.	2
153	16	32	.	.	.	.	.	.	.	20	.	4	.	2
154	16	32	.	.	.	.	.	.	.	20	.	4	.	2
155	16	32	.	.	.	.	.	.	.	20	.	4	.	2
156	16	32	.	.	.	.	.	.	.	20	.	4	.	2
157	16	32	.	.	.	.	.	.	.	20	.	4	.	2
158	16	32	.	.	.	.	.	.	.	20	.	4	.	2
	16	32	.	.	.	.	.	.	.	20	.	4	.	2

LOW-FED POPULATIONS—*continued.*

FARM LABOURERS—*continued.*

Foods.																								Value of Food.	Cards.			Illness.			Health.	Number.	Remarks.
Butter.	Dripping or Lard.	Suet.	Any separated Fats.	Bacon.	Meat and Bone.	Meat only.	Total Meat.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 1d. or 2d. per pint.	Cyder and Perry.			Total.	Per Head.	Per computed Adult.	Total.	Per Head.	Per computed Adult.			
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	lbs.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$			
1	1	1	1	12	8		21					5				21		3	6	2	2		0 19 8½	114,529		28,746	5,999		5,605	Good.	310	
1	1	1	1	12	1		13					6		4		14		14	3				0 12 6½	138,[illegible]	30,891	40,321	6,767	1,502	1,815	Moderate.	317	
1	1	1	1	12	4	1	17					8		4		14		14			21		0 11 10½	133,239		32,007	1,724		942	Good.	318	
1	1	1	1	12	4	1	17					8		4		14		14			21		1 1 10	297,302		40,992	5,950		5,214	Good.	319	
1	1	1	1	12	4	1	17					8		4		14		14	1	2	6		0 12 7½	134,299	28,198	33,752	3,902	1,207	1,451	Good.	320	
1	1	1	1	12	4	1	17					8		4		14		14	2		3		0 17 7½	191,091		30,216	6,701	8	1,878	Ill.	321	
1	1	1	1	12	5	1	18	2				14		4		14		14	3	2	4		0 16 2	205,346	54,506	45,627	4,957	1,303	1,716	Good.	322	
1	1	1	1	12	5	1	18	2				14		4		14		14	3	2	4		0 12 1	230,098	45,019	69,299	10,326	2,065	3,098	Good.	323	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 16 13½	185,809		35,209	5,982		1,867	Good.	324	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 18 2½	207,696	32,307	40,671	6,948	1,390	1,739	Good.	325	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		1 0 8	240,799	45,033	60,192	12,040	2,007	2,739	Good.	326	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 16 4½	169,991	30,111	39,892	6,741	949	1,263	Good.	327	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 19 11½	181,342	24,373	34,476	5,326	1,059	1,495	Good.	328	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 11 6½	220,693	24,138	30,171	4,913	982	1,228	Good.	329	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 11 11½	173,448	19,986	24,982	7,201	1,028	1,286	Not good.	330	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		1 2 9½	240,217	27,024	34,746	8,919	891	1,259	Good.	331	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 15 8	173,446	47,943	59,929	6,254	1,771	1,994		332	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 9 7½	113,796	28,486	37,981	6,333	1,691	1,972		333	Slaydcord.
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 12 3½	230,063	25,814	30,966	14,964	997	1,246	Good.	334	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 14 1	251,726	25,472	31,841	17,982	1,102	1,378		335	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 10 11	155,195		23,921	6,177		1,235	One not good.	336	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 8 11½	146,993	19,207	24,010	6,167	770	1,028	Good; thin.	337	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 11 4½	169,197	21,171	25,405	7,559	1,074	1,504	Moderate.	338	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 9 7½	193,659	27,379	34,209	6,268	1,164	1,532	Good.	339	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 10 [illegible]	113,949		27,554	3,451		2,575	Wife not good.	340	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 12 4	140,286	27,301	33,756	5,952	1,191	1,904		341	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 12 2½	172,112	30,328	40,704	6,378	1,149	1,534	Children pale, not good.	342	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 12 10	134,896		27,451	4,955		1,141		343	
1	1	1	1	12	6	1	19					8		4		14		14	1	2	4		0 17 10	205,013	53,876	65,852	10,731	1,790	1,790	Pale.	344	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 14 10	218,766	47,997	55,996	4,800	1,117	1,372	Moderate.	345	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 16 4	231,[illegible]		47,252	5,144		1,814		346	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 7 7½	160,202	23,456	29,320	4,823	964	1,607	Not very good.	347	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 16 7½	119,057	29,452	37,840	4,529	1,511	1,815	Good.	348	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 19 8½	138,609	31,736	39,670	6,354	1,907	1,462	One not good.	349	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 8 11½	153,654	22,177	27,721	3,354	998	1,332	Moderate.	350	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 7 11½	81,039	30,350	37,937	3,050	1,525	1,828	Good.	351	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 9 3½	197,847	30,815	42,954	3,998	1,333	1,599	Wife not good.	352	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 10 11	113,749		28,302	4,878		1,955	Good.	353	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 8 1	200,122	31,574	40,949	3,450	1,053	1,362	Moderate.	354	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		1 5 10½	180,063	31,203	34,004	8,253	1,376	1,907	Good.	355	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 13 8½	122,613		30,901	4,500		1,498	Good.	356	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 10 8	134,307		29,779	4,770		1,192	One not good.	357	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 14 11½	221,306	27,170	40,753	8,951	894	1,788	Good.	358	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 11 9	181,097	26,272	31,488	5,719	917	1,271	Children not well.	359	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 8 3½	93,010	27,870	33,744	3,[illegible]	1,043	1,254		360	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 18 9	214,720	35,788	50,083	8,943	1,490	2,236		361	
1	1	1	1	12	6	1	19					8		4		14		14	2	2	4		0 12 6½	154,089	33,652	40,500	4,809	1,237	1,603	Moderate.	362	

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

| Counties. | Parishes. | Number of Parishes. | Average Weekly Income. | | | Average Weekly Rent. | | | Average Weekly Earnings. | | | Average Weekly Expenditure. | | | Average Weekly Dietary. | | |

LOW-FED POPULATIONS—*continued.*

| Persons | | |

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

No.	County.	Parish.	Initials.	Number of Family.			Labourers having Plots at Rent.			Rent.			Income.		Occ., Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Milk.	All provisions received as Wages.	Potatoes.	Carrots, Turnips.	Sugar.	Treacle.	All articles bought.
				Above 10 years of age.	Below 10 years of age.	Total Males.	Every Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	Whole Family.															
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
608	Hertfordshire—*cont.*	Harpenden	F.	2	2	4				9 1 9			0 11 6	0 11 6															
609		Ditto	P.	2	2	4				10			0 11 6	0 11 6															
610		Ditto	P.	2	2	4				1 1 6			0 11 6	0 11 6															
611		Wheathampstead	B.	2	2	4				Free	Free		0 9 6	0 9 6															
612		Ditto	B.	2	2	4																							
613		No Man's Land	S.	2	2	4				1 1 6			0 10 6	0 10 6															
614		Sandridge	L.	2	1	3				1 1 6			0 11 6	1 1 6															
615	Huntingdonshire.	Great Stukeley	H.	2	2	4				4 10 6		0 10 6	0 11 6	1 1 6															
616		Ditto	F.	2	2	4				4 10 6			0 10 6																
617		Ditto	F.	2	2	4				Free	Free	1 5 6	0 10 6	0 10 6															
618		Hartford	G.	2	2	4				Free	Free		0 10 6	0 10 6															
619		Ditto	G.	2	2	4				1 16 6		1 6 6	0 10 6	1 1 6															
620		Wilton	C.	2	1	3				1 7 6		1 11 6			Half C.														
621		Godmanchester	T.	2	1	3				Free	Free		0 10 6	0 10 6															
622		Ditto	A.	2	2	4				4 5 6		1 1 6	0 11 6																
623	Cambridgeshire	Chatteris	G.	4	2	6				1 19 6 and land			0 11 6	1 1 6															
624		Ditto	R.	2	4	6					0 1 6		0 11 6	1 1															
625		Wimblington	F.	2	4	6				Free	Free		0 11 6	0 11															
626		Manea	M.	2	4	6				1 10 6			0 11 6																
627		March	B.	4	3	7				1 4 6			0 11 6	0 11 6															
628		Ditto	G.	4	3	7				1 4 6			0 11 6	0 11 6															
629		Ditto	Q.	4	4	8				1 4 6 and land			0 11 6	0 11 6															
630		Norwood Side	M.	2	4	6				1 12 6 and land			0 11 6	0 11 6															
631		Ely	A.	2	2	4				1 1 6		0 7 6	0 11 6	1 1 6															
632		Ditto	P.	2	2	4							0 10 6	0 10 6															
633		Prickwillow	C.	2	2	4				1 1 6			0 11 6																
634		Ditto	C.	2	2	4				1 1 6		0 7 6																	
635		Ditto	W.	2	2	4				1 1 6																			
636		Ditto	C.	2	2	4				1 1 6			0 10 6	0 10 6															
637	Bedfordshire	Woodside	W. H.	2	2	4				1 1 6																			
638		Ditto	T. C.	2	2	4							0 10 6	1 1 6															
639		Markyate Street	C. G.	2	4	6					0 2 6		0 12 6 Bo.	0 10 6															
640		Ditto	E. F.	4	4	8					0 1 6																		
641		Ditto	J. M.	4	4	8					0 1 6		0 11 6	0 11 6															
642		Cardington	S.	2	2	4	1			1 12 6		0 12 6 1 rood.	0 10 6	1 1 6															
643		Ditto	T.	2	2	4				1 1 6			0 10 6	0 11 6															
644		Ditto	T.	2	2	4				1 1 6			0 10 6	0 11 6															
645		Harrowden	M.	4	2	6				1 11 6			0 10 6																
646		Ditto	S.	4	1	5				1 11 6			0 10 6	0 11 6															
647		Elstow	W.	2	2	4				1 1 6			0 11 6	1 1 6															
		Ditto	C.	2	2	4							0 10																

LOW-FED POPULATIONS—*continued.*

Food.																						Value of Food.	Carbon.			Nitrogen.			Health.	Number.	Remarks.
Butter.	Dripping or Lard.	Suet.	All other animal fats.	Bacon.	Meat and Meat Meal.	Meat only.	Wet or Moist.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 3d. to 4d. per gal.	Quartern Peny.		Total.	Per Head.	Per consumer Adult.	Total.	Per Head.	Per consumer Adult.			
																						£ s. d.									

No.	County.	Parish.	Initials.	Number of Family. Above 16 years of age.	Number of Family. Below 16 years of Age.	Number of Family. Reckoned as Adults.	Labourers taking Food at Home. Every Day.	Labourers taking Food at Home. Occasionally.	Labourers taking Food at Home. Not at all.	Rent. House and Garden. Yearly.	Rent. House and Garden. Weekly.	Rent. Allotment yearly.	Income. Labourer.	Income. Whole Family.	Occ. Pig. Perch.
		ENGLAND—*continued.*													
48	Rutland	Burleythorpe near Oakham	.	1	.	1	.	.	.	1 9 0	. .	. .	0 12 0	1 16 0	
41		Ditto	I.	1	1	2	.	.	.	1 9 0	. .	. .	0 13 0	0 19 0	25
8		Ditto	F.	2	2	4	.	.	.	1 4 4	. .	0 10 0	0 14 0	. .	
		Oakham	.	.	.	.	.	.	.	. .	0 1 4	0 0 0	0 12 0	0 12 0	
885		Ditto	.	2	3	5	.	.	.	. .	0 1 11	0 0 0	0 12 0	0 12 0	
		Ditto	.	2	3	4½	.	.	.	. .	0 1 11	0 0 0	0 12 0	. .	
85		Langham	T.	1	.	1	.	.	.	1 0 0	. .	0 10 0	0 12 0	0 12 0	
		Ditto	P.	1	.	1	.	.	.	1 0 0	. .	0 10 0	0 12 0	0 12 0	
88	Yorkshire	Bentley near Doncaster	M. H.	2	2	4	.	.	.	1 13 0	. .	. .	0 16 0	1 19 0	
		Ditto	K.	2	.	2	.	.	.	. .	0 1 11	. .	0 12 0	. .	
815		Adwick	H.	1	1	2	.	.	.	1 1 0	. .	. .	0 12 0	0 12 0	
		Ditto	.	1	1	2	.	.	.	1 1 0	. .	. .	0 12 0	0 12 0	
		Ditto	E.	1	1	2	.	.	.	1 1 0	. .	. .	0 12 0	. .	
825		Marr	J.	1	.	1	.	.	.	1 10 0	. .	. .	0 12 0	. .	
		Ditto	.	1	1	2	.	.	.	1 10 0	. .	. .	0 12 0	0 12 0	
		Ditto	T.	1	1	2½	.	.	.	1 15 0	. .	. .	0 14 0	0 15 0	
818		Selby	J.	2	2	4	.	.	.	1 8 0	. .	1 0 0	0 14 0	1 1 0	
		Ditto	.	2	2	4	.	.	.	1 8 0	. .	. .	0 12 0	. .	
		Ditto	H.	2	3	5	.	.	.	1 8 0	. .	. .	0 12 0	. .	
58		Thorpe near Selby	C. S.	2	3	5	.	.	.	1 11 0	. .	. .	0 12 0	. .	
		Ditto	C. M.	2	3	5	.	.	.	1 8 0	. .	. .	0 12 0	. .	
52		Howden	E.	2	3	5	.	.	.	1 12 0	. .	. .	0 12 0	0 14 0	
		Ditto	.	2	3	5	.	.	.	. .	0 1 11	. .	0 12 0	0 12 0	
53		Thorpe near Howden	R.	2	4	6	.	.	.	1 8 0	. .	. .	0 12 0	. .	
		Ditto	.	2	4	6	.	.	.	1 8 0	. .	. .	0 12 0	. .	
2		Selby	W.	2	4	6	.	.	.	1 8 0	. .	. .	. .	0 18 0	
52		Thorpe	X.	2	2	4	.	.	.	. .	. .	. .	0 12 0	0 12 0	
		Ditto	.	2	2	4	.	.	.	. .	. .	. .	. .	. .	
9		Kelsterne	S.	1	.	1	.	.	.	1 12 0	. .	. .	0 0 0	0 12 0	
		Ditto	W.	1	2	3	.	.	.	1 10 0	. .	. .	0 0 0	0 11 0	
1		Ditto	H. S.	1	4	5	.	.	.	1 10 0	. .	. .	0 0 0	0 11 0	
88		Beverley	B.	1	4	5	.	.	.	. .	0 1 11	. .	0 12 0	. .	
		Burlington	C.	2	3	5	.	.	.	1 8 0	. .	. .	0 12 0	. .	
		Ditto	.	2	3	5	.	.	.	1 8 0	. .	. .	0 12 0	. .	
		Ditto	N.	2	4	6	.	.	.	. .	0 1 11	. .	0 12 0	0 12 0	
8		Ryedale	L.	1	3	4	.	.	.	1 9 0	. .	. .	0 0 0	. .	C. P.
8		Barkston	R.	2	.	2	.	.	.	1 4 0	. .	. .	0 14 0	. .	
8		Bempton	S.	2	2	4	.	.	.	1 3 0	. .	. .	0 0 0	. .	
8		Scalby	C.	3	.	3	.	.	.	1 3 0	. .	. .	0 0 0	. .	C. P.

FARM LABOURERS—*continued.*

Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maizlin.	Pea.	Bean.	All purchased expressly as Relief.	Potatoes.	Groats, Vegetables.	Sugar.	Treacle.	All purchased Provisions.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	7	.	.	.	.	.	.	.	.	.	.	.	.
14	14	.	.	.	.	.	.	.	14	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
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14	14	.	.	.	.	.	.	.	.	.	.	.	.
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14

LOW-FED POPULATIONS—*continued.*

FARM LABOURERS—*continued.*

ENGLAND—*continued.*

FARM LABOURERS—*continued.*

Number.	County.	Parish.	Initials.	Number of Family.			Labourer takes Food at home.			Rent.			Income.		Cots, Pits, Pands.																
				Under 10 years of age.	Below 10 years of age.	Husband and Wife.	Every Day.	Sundays only.	Not at all.	House and Gardens.	Weekly.	Allotment Yearly.	Labourer.	Whole Family.		Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Meslin.	Peas.	Rice.	All purchased Provisions at Retail.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All purchased Articles.
480	Yorkshire -	Scalby	G. H.	4	3	1				£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	C.F.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
481		Ditto		0	2	1				2 1 6			6 6 6	6 12 6		14						1		28	10	1	3	1	5
482		Old Malton	H.	4	4	1				4 12 6			6 6 6	6 12 6		14						1		28	10	1	3	1	5
483		Ditto	K.	3	1	1		1		16 6 6			6 6 6	6 12 6	C.	14						1		28	10	1	3	1	5
484		Swinton	C.	2	-	1				1 1 6			6 6 6	6 12 6		14						1		28	10	1	3	1	5
485		Ditto	C.	2	-	1				Odn	Odn		6 6 6	6 12 6	C.P.	14						1		28	10	1	3	1	5
486		Amotherley	G.	6	2	2							6 6 6	6 12 6		14						1		28	10	1	3	1	5
487		Ditto	P.	4	2	2			½	2 2 6			6 6 6	6 12 6	P.	14						1		28	10	1	3	1	5
488		Carlton near Thirsk	C.	3	4	2				3 19 6			6 6 6	6 12 6		14						1		28	10	1	3	1	5
489		Thirsk	D.	2	3	1				3 19 6			6 6 6	6 12 6	•	14						1		28	10	1	3	1	5
490		Chapel Haddesey	S.	2	3	1				Free	Free		6 11 6	6 12 6		14						1		28	10	1	3	1	5
491		Ditto	W.	2	2	1				3 7 6			6 11 6	6 12 6	G.F.	14						1		28	10	1	3	1	5
492		Penny Bridge	B.	6	1	2				3 6 6			6 11 6	6 12 6		14						1		28	10	1	3	1	5
493		Cowton Top	E.	3	1	1				4 3 6			6 11 6	6 12 6		14						1		28	10	1	3	1	5
										Free	Free		6 12 6	6 12 6		14						1		28	10	1	3	1	5

WALES.

494	Anglesey -	Isle of Anglesey	E.	3	1	2				Free	Free		6 12 6	6 12 6		14						1		28	10	1	3	1	5
495		Ditto	F.	3	1	2				2 16 6			6 12 6	6 12 6	C.F.	14						1		28	10	1	3	1	5
496		Ditto	O.	3	1	2				2 16 6			6 12 6	6 12 6	C.F.	14						1		28	10	1	3	1	5
497		Ditto	W.	3	1	2				2 16 6			6 12 6	6 12 6	C.F.	14						1		28	10	1	3	1	5
498	North Wales	Denbigh	E.	2	-	2				3 6 6		0 12 6	6 12 6	6 12 6	F.	14	1					1		28	10	1	3	1	5
499	Denbigh -	Llangollen	J.	2	2	2				3 11 6		0 12 6	6 12 6	6 12 6	F.	14						1		28	10	1	3	1	5
500		Ditto	C.	2	2	2				3 2 6		(in Co. Flint)	6 12 6	6 12 6	F.P.	14						1		28	10	1	3	1	5
501	Carnarvon -	Conway	W.	2	2	2							6 12 6	6 12 6		14						1		28	10	1	3	1	5
502	Denbigh -	Yaal	T.	2	2	2				4 6 6		Free	6 11 6	6 12 6		14						1		28	10	1	3	1	5
503		Trelon	F.	4	4	4				3 12 6			6 12 6	6 12 6		14						1		28	10	1	3	1	5
504		Pentrobin	F.	4	4	4				3 3 6			6 12 6	6 12 6	F.	14						1		28	10	1	3	1	5
505	Merioneth -	Dolgelly	T.	4	4	4				3 6 6			6 12 6	6 12 6		14						1		28	10	1	3	1	5
506		Ditto	T.	4	4	4				3 6 6			6 12 6	6 12 6	F.	14						1		28	10	1	3	1	5
507		Ditto	E.	3	3	3				3 6 6			6 12 6	6 12 6	F.	14						1		28	10	1	3	1	5
508		Ditto	E.	3	3	3				3 26 6			6 12 6	6 12 6	F.P.	14						1		28	10	1	3	1	5
509	Cardigan -	Machynlleth	T.	4	2	2				3 12 6			6 12 6	6 12 6	F.	14						1		28	10	1	3	1	5
510		Ditto	T.	3	2	2				3 12 6			6 12 6	6 12 6		14						1		28	10	1	3	1	5
511	South Wales	Aberystwith (near)	T. W.	3	-	2	-		-	3 12 6 & land.			5 4 6 & land.	6 9 6	C.F.	14						1		28	10	1	3	1	5
512	Cardigan-shire.	Ditto	J.	3	-	2							6 6 6			14						1		28	10	1	3	1	5
513		Ditto	D. E.	3	4	2							6 6 6			14						1		28	10	1	3	1	5
514		Ditto	J. J.	1	3	1							6 6 6			14						1		28	10	1	3	1	5
515		Lampeter (near)	D. E.	3	3	2							6 6 6 & land.			14						1		28	10	1	3	1	5
516		Ditto	J.	3	1	2							6 11 6			14						1		28	10	1	3	1	5
517		Ditto	J.	3	1	2							6 11 6			14						1		28	10	1	3	1	5
518		Ditto	J.	3	1	2							6 11 6			14						1		28	10	1	3	1	5
519		Ditto	J. J.	3	1	2							6 11 6			14						1		28	10	1	3	1	5
520		Ditto	J. E.	3	1	2				Free	Free		6 11 6			14						1		28	10	1	3	1	5

LOW-FED POPULATIONS—*continued.*

FARM LABOURERS—*continued.*

Fodder.																						Carbon.			Nitrogen.			Health.		Remarks.
Rubies.	Driggings or Lard.	Suet.	Animal Fats.	Beans.	Meals and Peas.	Meal only.	Total Meals.	Hominy.	Fish.	New Mills.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, strong, 1d. per pint.	Cyder and Perry.	Value of Food.	Total.	Per Head.	Per compared Adult.	Total.	Per Head.	Per compared Adult.		Number.	
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	lbs.	No.	No.	ozs.	ozs.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			
1				12	1		13				42		42			4	4	1				0 17 11	223,333	56,493	46,254	10,113	1,541	1,346	Good.	493	
1				12	1		13				34		34			4	4	1				0 9 91	120,949	23,000	20,994	6,797	930	1,020	Good.	495	
1				9	3		12				17		17			4	4	1				1 3 6	281,644	55,170	46,846	10,896	1,597	1,716	Good.	491	
1				9	3		12				17		17			4	4	1				0 15 0	207,750	41,000	37,304	8,337	1,539	1,307	Good.	492	
1				8			8			7						3	15	2				0 7 11½	64,872		22,452	3,815		1,859	Good.	493	
1	1			8			8			7						12	3	4				0 15 7	196,439		51,736	9,147		1,337	Good.	494	
1				8	3		11			12			12			4	4	1				0 9 11½	194,011		22,252	4,651		2,023	Good.	495	
1				8	4		12			12			12			4	4	1				0 11 10½	153,738	25,121	20,543	5,098	677	1,665	Good.	496	
1	1			11	2		13			7	7		14			2	2	4				0 14 6½	214,259	39,764	37,142	9,239	1,152	3,477	Good.	497	
2	1	1		11	1	3		14					14			2	2	2				0 13 10½	175,173	32,049	30,014	7,501	1,439	1,891	Good.	498	
1	1			11	1		12				14		14			10	2	6	5			0 13 11	196,813		23,906	4,858		2,215	Good.	499	
1	1			11	1		12				14		14				2					0 10 10½	120,139	21,240	15,644	3,423	1,157	1,809	Good.	500	
2	1	1		12	2	2		16				14	2	16				2	1			0 14 8½	177,304	33,379	27,332	7,079	1,013	1,698	Good.	501	
1	1	1		10	1		2	11			3	7		71			10	2		2		0 10 3	118,138	24,731	14,052	3,774	1,252	1,014	Good		502	Very truthful.
14				14	14	14		3	4					14			3	1				0 12 6	137,459	25,939	24,992	6,915	1,993	2,468	Good.		503	
14				14	14	14		3	4					14			3					0 11 6	124,839		21,119	4,105		2,447	Good.		504	
14				14	14	14		3	4					14			3	2				0 10 0½	127,498	26,788	23,427	6,149	1,584	1,079	Good.		505	
14				14	14	14		3	4					14			3					0 14 8½	217,993	43,364	39,548	8,199	1,623	2,092	Good.		506	
1		1		11	1	11		11			15	12	27				4	2		6		0 10 11	84,538		23,199	3,781		1,561	Good.		507	
14				14	14			3					14				3	4				0 7 10	115,099	20,309	20,345	4,647	1,113	1,462	Good.		508	
14	14			14	14			3		14			14			14	3	11				0 8 7½	107,822	22,979	19,455	5,714	903	1,879	Good.		509	
1		1		10	1	10		11			12		12				4	4				0 12 6	139,179	31,934	25,879	7,519	1,393	977	Good.		510	
11	1			8	12	1		6			4		24				4					0 12 6	122,651	23,162	24,217	5,389	1,207	1,729	Good.		511	
11		1		11	2	1		12	4				12				4					0 10 6	101,174	20,145	20,197	5,092	1,135	1,513	Good.		512	
				11	1			1	1				12				3	3				0 14 7½	144,719	30,574	29,122	10,422	1,252	1,252	Good.	Thin.	513	
				1	1	11		12	4		12	12	24				4	2				0 12 10	107,414	17,855	16,733	3,509	1,303	2,349	Good.		514	
				6	4	2		6	2		12	12	24			1	4	1				0 10 8½	171,324	33,911	40,020	7,214	1,404	2,062	Good.		515	
				6	4	2		6	2		12	12	24			1	4	1				1 4 11½	256,091	42,691	44,760	11,282	1,880	2,823	Good.		516	Respectable.
																						0 14 9	208,659	41,000	39,432	9,079	1,994	2,849	Good.		517	
1	1	1		11	1	1		13	2		11		11			1	3	4				0 15 11	199,741	31,252	33,549	8,845	1,873	1,703	Good.		518	
1				11	1	11		13	2		12		12				4	2				0 12 9	139,702	30,126	23,254	5,022	1,303	1,748	Good.		519	
				14	1			14		7						2	2					0 6 91	123,176		2,609	3,659		2,609	Good		520	Respectable.
				11				11			1	6	7				2	1	1			0 3 9	73,349		23,449	2,935		3,666	Good.		521	
										14			14				2					0 16 6½	156,705	25,092	27,199	6,384	1,668	1,598	Good.		522	
										14			14				2					0 3 9½	109,999	20,051	12,042	4,789	1,197	1,014	Good.		523	
																						0 10 6	265,467	54,245	51,324	8,022	1,957	1,952	Good.		524	
																						0 14 9	103,599		14,531	2,972		2,217	Good.		525	
																						0 12 3	207,252	39,697	37,698	8,293	1,344	1,568	Good.		526	Most Mean.
																						0 9 6	150,327	21,475	24,054	6,998	996	1,568	Good.		527	
																						0 5 11	140,923	35,231	23,504	6,267	1,566	1,179	Good.		528	
																						0 12 4½	205,189		23,598	8,899		1,462	Good.		529	

Number.	County.	Parish.	Initials.	Number of Family.			Labourer taking Food at Home.			Rent.			Income.		Cow, Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Muslin.	Peas.	Rice.	All purchased or obtained in Money.	Potatoes.	Other Vegetables.	Boys.	Girls.	All Children under 15 Years.
				Above 15 Years of Age.	Below 15 Years of Age.	Registered Adults.	Every Day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	White Family.															
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
		WALES—continued.																										
130	Cardiganshire—cont.	Llandyssil	M. T.	12	-	12				::	& repairs.	::	£ 0 5 0 and land.	::						60				60				
131		Aber	M. J.	3	-	3				3 15 0	::	::	£ 0 7 0 and land.	::														
132		Ditto	M. D.	3	-	3				3 15 0	::	::	£ 0 7 0 and land.	::														
133		Newcastle in Emlyn, near	D. P.	6	-	6				Free	Free	::	£ 0 1 0 and land.	::														
134		Ditto	W. L.	2	-	2				Free	Free	::	£ 0 1 0 and land.	::														
135		Ditto		4	-	4				Free	Free	::	£ 0 1 0 and land.	::														
136		Ditto		2	-	2				2 6 0	::	::	£ 0 1 0 and land.	£ 0 7 0														
137	Pembrokeshire.	Little Honeyborough	T.	2	2	3				2 0 0	::	::	£ 0 15 0	::						16				16				
138		Ditto	E.	2	1	3				::	::	::	::	::														
139		Ditto	E.	2	1	3				::	::	::	::	::														
140		Honeyborough	G.	4	3	7				Free	Free	::	£ 0 5 0	£ 0 10 0						16				16				
141	Carmarthenshire.	Merthyr, near Carmarthen		2	2	4				2 0 0	::	::	£ 0 3 0	::														
142		New Church, near Carmarthen.		2	4	6				2 15 0	::	::	£ 0 5 0	::														
143		Llanstin		2	2	4				2 15 0	::	::	£ 0 5 0	::														
144		Ditto		2	2	4				2 0 0	::	::	£ 0 15 0	£ 0 5 0														
145		Ditto		2	2	4				2 0 0	::	::	£ 0 15 0	£ 0 5 0														
146		Ditto		2	2	4				2 10 0	::	::	£ 0 15 0	£ 0 5 0	C. F. P.													
147		Carmarthen, near		1	-	1				::	::	::	::	::														
148		Carmarthen, Pwtrain		3	-	3				::	::	::	::	::														
149		Carmarthen, near		3	1	3½				::	::	::	::	::														
150	Glamorganshire.	Swansea, near		3	-	3				10 0 0 and land.	::	::	£ 0 16 0	::														
151		Ditto	D. Y.	3	-	3				::	::	::	::	::														
152		Ditto	J. W.	3	-	3				::	::	::	£ 0 12 0	£ 0 10 0														
153		Ditto		3	-	3				2 10 0	::	::	£ 0 12 0	£ 0 5 0	C. F. P.													
		SCOTLAND.																										
154		Ardintlie, near Glen	K. B.	2	4	6				Free	Free	Free	18 0 0 &c.	::	C. F. P.		11	63						74	45				
155		Kilmuir	A. M.	2	4	6				Free	Free	Free	0 0 0	::	F.		14	63						77	45				
156		Dunskaffrage		2	3	5				2 0 0 and land.	::	::	::	::	F. C.		14	53						67	84				
157		Ditto	C.	3	3	6				2 0 0 and land.	::	::	0 5 0	::	C. F.			84						84	126				
158		Ditto	R.	2	1	3				Free	Free	::	26 0 0	::			4	171						175	84				
159		Kilmalie, near Fort William.		6	-	6				2 10 0 and land.	::	::	::	::	2 C.		9	30						39	252				
160		Ditto		3	-	3				Free	Free	::	::	::	2 C. F. P.			126						126	63				
161		Ditto		3	-	3				Free	Free	::	15 0 0	::	2 C. F. P.			126						126	63				
162		Ditto	C.	3	2	5				10 10 0	::	::	::	::	C. F.													
163		Inverlochy, near Fort William.	M. P.	1	1	2				Free	Free	::	18 0 0	::	2 C.			28						28	196				
164		Fort Augustus		4	-	4				::	::	::	::	::	2 C.			28						28	84				
165		Ditto		3	-	3				3 10 0 and land.	::	::	::	::				28						28	84				
166		Inverness	M. P.	2	2	4				3 10 0 and land.	::	::	::	::				28						28	84				
167		Ditto	M. R.	1	-	1				Free	Free	::	22 0 0 &c.	::	F.	4	14	28				14		56	42				
										Bothy	Bothy	::	18 0 0 &c.	::		8		14						22	21				

LOW-FED POPULATIONS—*continued.*

Number.	Description of Land.	Stock.	All the Grain Eats.	Beans.	Meat and Bone.	Meat only.	Total Meat.	Herrings.	Fish.	Raw Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Fat.	Offals.	Beer, ordinary.	Beer, strong, 1d. or 2d. per pint.	Cyder and Perry.	Value of Food.	Total.	Per Head.	Per unexpended Adult.	Total.	Per Head.	Per unexpended Adult.	Health.	Number.	Remarks.

Number.	County.	Parish.	Initials.	Number of Family.			Labourer eating Food at Home.			Rent.			Income.		Cow, Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Mealie.	Peas.	Rice.	All Purchased and Received as Relief.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All Separately Entered.
				Above 15 Years of Age.	Below 15 Years of Age.	Reckoned as Adults.	Every Day.	Sundays only.	Not at all.	Yearly.	Weekly.	Abatement yearly.	Labourer.	Whole Family.														
		SCOTLAND—*continued.*																										
										FARM LABOURERS—*continued*																		
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
368		Inverness, Mungfield	-	-	2	2	4	—	—	—	Free	Free	..	16 0 0 &c.	..	F. F.	2	7	21	-	-	-	-	-	61	40	-	1	1	2
369		Ditto, Milburn	-	C.	2	2	3	—	—	—	Free	Free	..	16 0 0 &c.	..	-	-	17½	40	-	21	-	22	Fruit sarce 1	76½	40	-	3	-	1
370		Ditto, ditto	-	F.	2½	-	2	—	—	—	Free	Free	..	16 0 0 &c.	..	-	4	-	14	-	-	-	-	-	25	20	-	2	-	2
371		Ditto, ditto	-	-	2	1	3	—	—	—	Free	Free	..	0 9 0 &c.	..	-	3	-	14	-	1	-	-	-	27	22	-	2	2	3
372		Ditto, ditto	-	M'D.	1	-	1	—	—	—	..	0 12 0	..	0 12 0 &c.	..	-	3	-	14	-	1	-	-	-	29½	14	-	1	-	1
373		Ditto, Bobskine and Aberfarff		D. R.	2	4	4	—	—	—	Free	Free	..	15 0 0 &c.	..	F. F.	-	-	28	-	-	-	-	-	28	100	-	24	-	14
374		Ditto, ditto	-	A. F.	2	-	2	—	—	—	Free	Free	..	20 0 0 &c.	..	-	-	-	28	-	-	-	-	-	28	14	-	1	-	1
375	PERTHSHIRE	Drummakier	- - -	M.	3	3	4	—	—	—	Free	Free	..	13 0 0 &c.	..	C. F. F.	4	14	28	-	7	-	-	-	71	40	-	1	-	1
376		Glen Hobo	- -	-	2	3	3	—	—	—	Free	Free	..	..	..	C. F. F.	3	14	28	-	-	-	-	-	44½	24	-	2	-	2
377		Ditto	- - -	W.	2	3	3	—	—	—	Free	Free	..	20 0 0 &c.	..	F.	4	21	17½	-	21	-	-	-	63½	42	-	3	-	3
378		Ditto	- - -	P.	2	1	3	—	—	—	Free	Free	..	20 0 0 &c.	..	-	-	7	14	-	21	-	-	-	42	24	-	12	-	15
379		Ditto	- - -	R.	2	1	3	—	—	—	Free	Free	..	14 0 0 &c.	..	F.	4	21	14½	-	-	-	-	-	39½	40	-	1	1	14
380	ROXBURGH-SHIRE.	Accrington	- -	-	0	-	0	—	—	—	..	..	..	0 18 0	..	-	-	-	14	-	-	-	-	-	14	40	-	2	-	2
381		Newcastle Town	- -	-	2	-	2	—	—	—	2 0 0 and land	..	..	0 13 0	..	C.	-	14	7	-	-	-	-	-	21	20	-	1	-	1
382		Cassell	- - -	-	2	3	3	—	—	—	Free	Free	..	0 16 0 yearly.	0 12 0	-	-	21	7	-	7	-	-	1	35½	20	-	2	-	2
		IRELAND.																										
383	TIPPERARY	Archer's Town, near Thurles.		R.	4	2	5	—	—	—	Free	Free	..	0 7 6	0 13 6	F.	-	7	-	56	-	-	-	-	87½	140	-	11	-	11
384		Littleton	- - -	R.	4	-	4	—	—	—	2 0 0	..	..	0 0 0	0 0 0	F.	21	-	-	56	-	-	-	-	98	-	-	4	-	4
385		Ditto	- - -	C.	2	2	3	—	—	—	Free	Free	..	0 0 0	..	F. F.	-	-	-	-	-	-	-	-	-	24	-	-	-	-
386		Ditto	- - -	-	2	2	3	—	—	—	..	..	..	..	..	F. F.	-	-	-	-	-	-	-	-	-	24	-	-	-	-
387		Ditto	- - -	-	2	2	3	—	—	—	Free	Free	..	0 7 6	..	F. F.	-	-	21	-	-	-	-	-	21	24	-	-	-	-
388		Ditto	- - -	-	2	2	3	—	—	—	0 11 6	..	..	0 0 0	..	F.	-	-	-	56	-	-	-	-	56	96	-	-	-	-
389		Mienby	- - -	C.	2	2	4	—	—	—	1 16 0 and land	..	..	0 0 0	0 10 0	C. F.	21	-	-	70	-	-	-	-	91	96	-	11	-	11
390	KERRY	Killorney	- -	L.	4	4	8	—	—	—	..	0 0 0	..	0 0 0	0 15 0	-	-	-	-	70	-	-	-	-	70	196	-	11	-	11
391		Ditto	- - -	F.	2	-	2	—	—	—	..	0 0 0	..	..	..	-	-	-	-	42	-	-	-	-	42	84	-	3	-	3
392		Ditto	- - -	C.	3	4	6	—	—	—	..	..	..	0 0 0	0 0 0	-	-	-	14	70	-	-	-	-	84	112	-	11	-	11
393		Tralee	- -	-	2	2	3	—	—	—	2 0 0	..	..	..	..	F.	-	-	21	42	-	-	-	-	63	14	-	-	-	-
394		Turlokl	- - -	S.	7	-	7	—	—	—	1 0 0	..	0 10 0 1 acre.	0 0 0	0 15 0	F.	14	-	-	112	-	-	-	-	126	-	-	-	-	-
395					-	-	-	—	—	—	..	..	..	..	..	-	21	-	-	-	-	-	-	-	-	294	-	-	-	-
396		Ditto	- - -	M.	2	2	4	—	—	—	..	0 0 0	..	0 0 0	0 10 0	F.	-	14	-	84	-	-	-	-	98	1274	-	-	-	1

LOW-FED POPULATIONS—*continued*.

Food																						Value of Food.	Carbon			Nitrogen			Health.		Remarks.
Butter.	Dripping or Lard.	Suet.	All separated Fats.	Bacon.	Meat and Bone.	Meat only.	TOTAL MEAT.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Buttermilk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Coffee.	Beer, ordinary.	Beer, weak, 1d. or 1½d. per pint.	Cyder and Perry.		Total.	Per Head.	Per consumed Adult.	Total.	Per Head.	Per consumed Adult.		Nurses.	
FARM LABOURERS—*continued*.																															
Ibs.	Ibs.	Ibs.	Ibs.	lbs.	lbs.	lbs.	lbs.	No. fresh	lbs.	pts.	pts.	pts.	pts.	lbs.	lbs.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			
1			1		1		1	6		12			12				2					6 11 3	110,891	36,600	45,750	3,672	1,814	2,268	Good	368	A griever.
1			1		1		1	10		10			10				2					6 14 7½	103,978	42,000	52,500	3,240	1,296	1,620	Good.	369	
1½			1½		1½		1½	7		12			12				3					6 7 11	91,125		40,500	3,027		1,642	Good.	370	Grieve.
1½			1½		1½		1½	10		10½			10½				4	4				6 12 10	143,991	51,273	70,200	4,722	1,404	1,833	Good.	371	
1			1		1		1	6		12			12				2	2				6 8 6			57,600			2,365	Good.	372	
1			1		1		1				9½		9½				2					6 6 5	99,991	16,650	74,250	4,590	765	1,224	Good.	373	
1			1								15		15				2				1	6 11 2	179,221		83,250	7,245		3,321	Good.	374	
1			1	21			21				11		11			6	3					6 14 9½	119,295	36,379	49,500	10,199	1,699	2,268	Good.	375	
1			1	22	15		37				12½	45	57½			6	6					6 15 4	216,705	67,125	89,500	10,816	3,181	3,980	Good	376	Shepherd.
1			1	4			4					36	36				2					6 19 8	156,886	30,933	45,257	5,039	1,895	2,979	Good.	377	
1			1				1					24	24				2					6 7 6½	77,806	23,666	31,555	4,057	1,242	1,651	Good.	378	
1			1	21	12		45				12		12			1	2					6 12 7½	143,819	53,667	71,556	6,216	2,319	3,092	Good	379	Shepherd.
2			2	7	7		14				6		6			3	3					1 2 5	288,667		59,777	9,857		1,897	Good.	380	
1			1	9		1	10				18	6	24			7	2					6 8 6	114,711		27,375	5,449		2,774	Good.	381	
1			1	4		1	5				14	4	18			33	2	4	1				6 19 8	149,669	39,033	52,044	6,852	1,709	1,897	Good.	382	
2			2	8			8				56		56			14						6 12 11	319,233	80,000	70,400	14,662	3,666	3,226	Good	383	Very dirty.
																						6 6 7½	297,800		39,725	9,898		2,279	Good.	384	
																						6 6 8	171,434	42,858	57,144	7,253	1,808	2,317	Good.	385	
																						6 7 10½	114,823		27,443	5,134		3,134	Good.	386	
																						6 5 11½	174,996	44,247	59,000	8,566	2,144	2,855	Good.	387	
				4			4															6 8 10	327,649	56,274	75,032	18,581	3,429	4,571	Good	388	Wretched.
																						6 19 12	299,864	50,797	76,196	11,800	2,278	3,372	Good.	389	
				41	24	24	89				24		24									6 19 10	284,774	50,888	66,720	18,190	1,619	2,159	Good	390	Wretched.
																							277,974			19,447					
				3	24	24	51				24		24									6 8 6	143,846		71,923	8,629		4,314	Good.	391	
																							138,920			8,744					
				3	24	24	51				24		24									6 7 11	299,870	41,594	57,682	14,771	2,957	3,674	Good.	392	
																							294,972			8,748					
				4			4															6 8 6	236,299	56,572	75,429	13,695	2,974	3,965	Good.	393	
				6			6															6 15 6	156,845		39,249	12,865		3,213	Good.	394	
																							151,170			10,791					
				12	24	24	60				24		24			3						6 10 7½	299,893	43,823	60,095	14,236	2,919	3,315	Good.	395	
																							294,893			8,699					

Number.	County.	Parish.	Initials.	Number of Family.			Labourers taking Food at home.			Rent.			Income.		Occ., Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Meslin.	Peas.	Rice.	All preparations specified as Bread.	Potatoes.	Vegetables.	Sugar.	Treacle.	All separately specified.
				Above 12 years of Age.	Below 12 years of Age.	Reckoned Adults.	Every day.	Sundays only.	Not at all.	House and Garden. Yearly.	House and Garden. Weekly.	Allotment yearly.	Labourer.	Whole Family.															
	IRELAND—*continued.*									**FARM LABOURERS**—*continued.*																		
600	Limerick	Kilbeaha	L.	4	1	4½	—	—	—	£ s. d. 2 10 0	£ s. d. ..	£ s. d. —	£ s. d. 0 6 0	£ s. d. 0 6 0	V.	Bs. —	Bs. 28	Bs. —	Bs. 42	Bs. —	Bs. —	Bs. —	Bs. —	Bs. 87½	Bs. 14	Bs. —	Bs. 2	Bs. —	Bs. 2
601		Lighill	C.	4	2	5	—	—	—	1 5 0	..	1 10 0 1 acre.	0 6 0	0 6 0	—	—	—	—	70	—	—	—	—	98	—	—	—	—	—
602		Robertstown		3	3	6	—	—	—	2 0 0	..	2 0 0 1 acre.	0 6 0	0 12 0	V.	—	28	—	70	—	—	—	—	126½	—	—	1	—	3
603		Coolyhane	M.	4	1	4½	—	—	—	Free	Free	0 5 0 ½ acre.	0 3 0	0 12 0	P. F.	—	—	—	70	—	—	—	—	98	—	—	4	—	4
604		Ditto	H.	3	—	3	—	—	—	Free	Free	0 5 0 ½ acre.	..	..	P. F.	—	28	—	56	—	—	—	—	84	—	—	3	—	3
605	Clare	Cruahora	D.	3	—	3	—	—	—	1 0 0	5	..	..	..	V.	—	28	—	14	—	—	—	—	84	—	—	1	—	1
606		Bunshow	S.	3	1	3½	—	—	—	Free	Free	..	..	..	V.	—	—	—	112	—	—	—	—	154	—	—	3	—	3
607		Ballystoon	M.	3	3	6	—	—	—	free	free	0 10 0 1 acre	0 3 0	..	—	—	28	—	56	—	—	—	—	168½	—	—	—	—	—
608		Ditto	M.	3	—	3	—	—	—	..	..	..	0 6 0	0 12 0	V.	6	14	—	28	—	—	—	—	168½	—	—	1	—	1
609		Ballycross	M. G.	7	—	7	—	—	—	Free	Free	0 5 0 ½ acre	0 6 0	1 10 0	—	—	—	—	98	—	—	—	—	147	—	—	3	—	3
610	Galway	Cort	C. S.	6	—	6	—	—	—	..	..	..	..	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
611		Ditto	C. S.	6	—	6	—	—	—	0 1 6 0 1 6	..	..	0 7 6	..	P. F.	—	28	—	42	—	—	—	—	105	28	—	1	—	1
612		Chaher	P. B.	3	1	4½	—	—	—	..	..	..	0 5 0	0 12 0	—	—	28	—	112	—	—	—	—	168	—	—	3	—	3
613		Kilcommon	C.	3	1	3½	—	—	—	..	..	..	0 5 0	..	C. P. F.	—	28	—	70	—	—	—	—	168	14	—	—	—	—
614		Core		4	—	4	—	—	—	1 10 0 ¼ land.	..	..	0 5 0	0 10 0	C. P. F.	—	—	—	84	—	—	—	—	117	—	—	—	—	—
615		Monstrose	M.	3	1	3½	—	—	—	..	..	..	0 5 0	..	—	—	—	42	112	—	—	—	—	168½	28	—	—	—	—
616		Ditto		3	—	3	—	—	—	..	..	..	..	..	—	—	14	14	28	—	—	—	—	168	—	—	—	—	—
617		Carhoonie	C.	4	—	4	—	—	—	2 10 0 ¼ land.	..	..	..	..	—	—	28	—	—	—	—	—	—	168	168	—	11	—	11
618		Tuam		6	—	6	—	—	—	..	..	..	..	..	—	—	14	—	28	—	—	—	—	168	28	—	1	—	1
619		Ditto	M. D.	6	—	6	—	—	—	..	..	..	..	..	—	—	14	—	28	—	—	—	—	168	28	—	1	—	1
620		Ditto		6	—	6	—	—	—	..	..	..	..	..	—	—	14	—	28	—	—	—	—	168	28	—	1	—	1
621		Ditto Black Cave	M.	4	—	4	—	—	—	free	free	free	0 5 0	..	—	12	28	14	28	—	—	—	—	168	28	12	1	—	1
622		Ditto		4	4	8	—	—	—	Free	free	Free ½ acre	0 5 0	0 7 6	V.	—	14	14	28	—	—	—	—	112	—	—	—	—	—
623		Ditto Kilclaghane	T.	6	3	7½	—	—	—	2 0 0 ¼ land.	..	..	..	..	C. F.	—	14	14	28	—	—	—	—	84	—	—	1	—	1
624		Ditto Ditto	N.	3	1	3½	—	—	—	free	free	2 0 0 Uncertain	0 5 0	..	C. F.	—	12	28	56	—	—	—	—	168	—	—	1	—	1
625		Ditto Galway road	M.	6	1	6½	—	—	—	1 10 0 ¼ land	..	..	0 5 0	..	P. F.	—	14	14	42	—	—	—	—	112	7	—	11	—	11

LOW-FED POPULATIONS—*continued.*

FARM LABOURERS—*continued.*

Number.	County.	Parish.	Initials.	Number of Family. Above 10 years of Age.	Below 10 years of Age.	Reckoned as Adults.	Labourer taking Food at Home. Every Day.	Sundays only.	Not at all.	Rent. House and Garden. Yearly.	Weekly.	Allotment yearly.	Income. Labourer.	Whole Family.	Cow, Pig, Fowls.	Bread.	Flour.	Oatmeal.	Indian Meal.	Barley Meal.	Maslin.	Peas.	Rice.	All foregoing reckoned as Bread.	Potatoes.	Green Vegetables.	Sugar.	Treacle.	All separated Sugars.
	IRELAND—*continued.*																												
										£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
622	WESTMEATH	Mullingar	D.	4	.	4	—	.	.	free	free	..	0 6 0	..		.	7	21	14	.	.	.	.	28½	21	.	½	.	½
623		Ditto	W.	2	2	4	—	.	.	free	free	..	0 6 0	..		.	14	.	28	.	.	.	.	28½	.	.	½	.	½
624		Ditto	K.	5	3	4½	—	.	.	1 5 0	..	..	..	0 11 0	C. F. P.	.	28	42	28	.	.	.	.	138½	.	.	1	.	1
				.	.	.	.	.	.	..	..	..	..	..		.	28	.	.	.	.	.	.	.	427	.	.	.	.
625	CATAN	Cocan	C.	6	.	6	—	.	.	..	0 1 0	..	0 6 0	0 10 0		.	1	.	63	.	.	.	7	20½	100	.	1	.	1
626		Ditto	C.	3	.	3	—	.	.	..	0 1 0	..	0 6 0	0 13 0		28	.	.	.	.	.	.	.	28	40	.	1½	.	1½
627	MONAGHAN	Clones	M.	4	3	5	—	.	.	..	0 1 0	..	0 3 0	..		.	7	.	42	.	.	.	.	49½	.	.	1½	.	1½
				.	.	.	.	.	.	..	..	..	..	..		.	7	.	.	.	.	.	.	.	220½	.	.	.	.
628	ARMAGH	Armagh	M.	2	1	2½	—	.	.	free	free	..	0 7 0	..		16	7	10	.	.	.	.	1	41½	28	.	2	.	2
629		Ditto	P.	3	.	3	—	.	.	free	free	..	0 8 0	0 9 0		4	14	.	21	.	.	.	.	53	28	.	1½	.	1½
630		Ditto Cargie	M.B.	2	1	2½	—	.	.	..	0 1 0	..	0 7 0	..		8	7	.	30	.	.	.	.	50½	28	.	1	.	1
631		Ditto (near)	K.	4	3	5½	—	.	.	..	..	..	0 7 0	0 13 0		4	3½	10	30	.	.	.	.	67½	.	.	1½	.	1½
632		Ditto	K.	2	.	2	—	.	.	..	0 1 0	..	0 4 0	..		.	3½	.	14	.	.	.	.	24½	24½	.	½	.	½
													& food																
633		Ditto	G.	5	.	5	—	.	.	..	0 1 0	..	0 7 0	1 5 0		4	7	15	28	.	.	.	.	62½	.	.	1	.	1
634		Ditto (near)	S.	4	1	4½	—	.	.	..	0 1 0	..	0 7 0	0 15 0		18	14	29	14	.	.	.	.	85½	28	.	1½	.	1½

LOW-FED POPULATIONS—*continued.*

Foods.																						Value of Food.	Carbon.			Nitrogen.			Health.	Number.	Remarks.
Butter.	Dripping or Lard.	Suet.	All separate Fats.	Bacon.	Meat and Bone.	Meat only.	Total Meat.	Herrings.	Fish.	New Milk.	Skimmed Milk.	Butter Milk.	All Milk.	Whey.	Cheese.	Eggs.	Tea.	Cake.	Beer, ordinary.	Beer, weak, 1d. or ½d. per pint.	Cyder and Perry.		Total.	Per Head.	Per consumer Adult.	Total.	Per Head.	Per consumer Adult.			

FARM LABOURERS—*continued.*

lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs.	pts.	pts.	pts.	pts.	pts.	lbs.	No.	ozs.	ozs.	pts.	pts.	pts.	£ s. d.	grs.	grs.	grs.	grs.	grs.	grs.			
																													Good.		
																													Good.		
																													Good.		Very intelligent.
																													Good.	

APPENDIX.

Nos. 6, 7. *Conditions of Nourishment.*

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

No. 7.—Dr. Robert Barnes's Report on the Occurrence of Sea Scurvy in the Mercantile Navy, based chiefly upon the Experience of the Seamen's Hospital Ship, "Dreadnought," lying off Greenwich.

Scurvy is pre-eminently a preventable disease. The mode of preventing it is as well known and as certain as is the mode of preventing small-pox. If small-pox attack an individual, and spread in a community, it is simply because vaccination has been neglected. If scurvy break out in a poorhouse, a prison, a garrison, or on shipboard, it is simply because the inmates or the crew have not been properly fed. Scurvy is the result of starvation. An aliment essential to the preservation of health has been withheld. The vegetarian is ridiculed for denying himself the enjoyment of flesh; but he is not so irrational in practice as the man who limits his diet to salt meat and flour. It is safer to do without flesh than it is to do without vegetable; but the vegetarian, enthusiastic theorist as he is, is far from being so exclusive in his practice as the anti-vegetarian sailor. The vegetarian has no prejudice against the use of milk and eggs; from these materials he draws the essential nitrogenous or animal elements which the vegetable kingdom will supply but imperfectly. The proportions and kinds of animal food he employs may not be the best chosen, but he omits no necessary material for the sustenance of his body. Not so the animal-feeder; he attempts the impossible task of supporting in health the frame of a being designed by nature to be omnivorous, that is, frugivorous as well as carnivorous, by rejecting the indispensable gifts of the vegetable world.

Scurvy preventable.

There is no fact so well attested by the history of mankind as the dependence of scurvy upon the negation of fresh vegetable food. Death itself is scarcely more certain as the consequence of absolute starvation than is scurvy, a partial death of the blood, the consequence of privation of vegetable food. Upon this point experience is complete, and leaves nothing to desire, except indeed that its dictates be obeyed in practice.

Scurvy is by no means a disease proper to the sea. The same neglect of vegetable food will equally produce the disease on shore. The term "sea-scurvy" is only so far appropriate that it indicates a disease which landsmen have in recent times taken care to obviate. When sailors shall have taken the same care there will be neither sea-scurvy nor land-scurvy. The abolition of scurvy is entirely a question of diet, and a very simple question of diet. The whole secret consists in adding to the ship-dietary a moderate proportion of fresh vegetables, or, in default of this, half-an-ounce daily of preserved lime juice. Surely never was immunity from a frightful scourge so cheaply or so pleasantly purchased, and never was subjection so wilful or so criminal.

The proofs, springing out of experiments and facts, upon which the foregoing dictum rests, are matter of history. They have long since passed from the debateable domain of science. They form an inalienable part of the common knowledge of mankind.

Land-scurvy.

Before long sea-voyages were encountered, scurvy was almost exclusively a land disease. And even so lately as the 17th and 18th centuries, scurvy prevailed extensively as an endemic in all the northern countries of Europe during winter and early spring. It invariably disappeared as vegetation was renewed under the influence of summer. In the southern countries, where the winter is short, and the use of vegetable food was always more free, scurvy was comparatively unknown. During the last century scurvy prevailed extensively in

Holland. The country was then badly drained, and therefore badly cultivated; and the food of the people consisted chiefly of salt pork and beef. Since drainage and improved cultivation have supplied a more varied and more abundant vegetable food, scurvy has been avoided. England and Scotland furnish exactly similar facts. Three centuries ago agriculture, and especially that branch of the art to which the term horticulture more strictly applies, was practised in the rudest manner; and in many important points was entirely neglected. In Scotland, during the last century, Dr. Lind tells us the disease was very prevalent under the name of "*black-legs*." The same author also states, on the authority of Dr. Huxham, that 100 years ago scurvy was endemic in some seaport towns of Devon and Cornwall. Such was the neglect of the cultivation of vegetables in this country until recent times, that Hume relates that in the reign of Henry VIII. Queen Catherine despatched a messenger to Holland or Flanders whenever she wanted a salad. It is remarkable that London still draws largely from the carefully-tended market-gardens of those countries for its daily supply of antiscorbutic vegetables. But the greatest security we now enjoy against the prevalence of scurvy is, I believe, in the growth of the potato.

Security against scurvy on land greatly dependent on the potato.

The value of this tuber consists in the capability of storing it for winter use, when few fresh vegetables can be obtained. Many direct experiments prove the efficacy of the potato as a curative remedy in scurvy. And it may be confidently affirmed that, as a preventive remedy, it is all-sufficient, since many thousands of our population who get no other succulent vegetable are preserved in health throughout protracted winters. We are not without recent evidence of the evil that would follow upon the failure of this vegetable.

Scurvy in Scotland from failure of the potato in 1847.

During the winter and spring of 1846–7 scurvy prevailed extensively in Scotland. A valuable history has been given of this outbreak by Doctor Christison (Edinburgh Medical Journal, 1847). Numerous cases of scurvy arose amongst the general population of Edinburgh and the surrounding country; and the labourers engaged in various railway works suffered severely. There had been a failure of the potato crop. The dietary of the sufferers had consisted almost exclusively of bread and coffee with sugar, but without milk, and occasionally a little salt fish and fresh meat. The railway labourers had drawn their food from the truck or "tommy" shops of the contractors. It consisted of bread, salt pork, salt butter, cheese, coffee, tea, and sugar. Doctor Christison observed that "in the course of his professional observation "he had seldom met with an incident so startling, and, on a superficial "view, so unaccountable as this epidemic among railway labourers. "During thirty years he had not seen a single case of scurvy in the "wards of the Edinburgh Infirmary." The inquiries of Doctor Christison as to the food under the use of which his patients had fallen ill, and the complementary evidence derived from their rapid recovery when placed upon a full dietary, are entirely sufficient to account for the outbreak which he witnessed. There is nothing so exceptional in this outbreak as compared with others, or with the occurrence of isolated cases in all parts of the world, as to require assent, even qualified, to the assumption he appears to favour, that it was determined by "some particular epidemic constitution." Scurvy is only epidemic when large numbers of persons are deprived at the same time of vegetable food. Aggregation in no way alters the strictly specific cause which produces each individual case.

In Ireland.

During the same winter 1846–7 scurvy prevailed extensively in Ireland. This outbreak has been admirably described by Doctor Curran.

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(Dublin Quarterly Journal of Medicine, 1847). This physician says, on the authority of Mr. Curry and Sir William Wilde, both eminent for their knowledge of Irish history, that only few and doubtful indications could be found of scurvy having existed in Ireland in ancient times. This was probably because the Irish have always been pre-eminently, as Strabo calls them, "κοψάγοι," or vegetable eaters. But in 1847 scurvy seems to have afflicted Ireland far more extensively than it did either England or Scotland. Doctor Curran says, "In this year we "have information of the appearance of true scurvy in all the cities "and large towns in Ireland, with but two exceptions." Numerous cases were admitted into the hospitals of Dublin. Doctor Curran, speaking as to the cause, tells us "in four fifths of the cases reported "to me bread and tea or coffee was what the patients had been living "on when attacked; the others had been using grains of various "kinds, or grains and flesh or fish, *but in no single instance* could "I discover that green vegetables or potatoes had formed a part of "their regular dietary."

Nor did the disease afflict exclusively the poor whose food was often deficient in quantity. Many persons in easy circumstances were attacked. They suffered like their indigent neighbours from the failure of the potato and the want of other compensating vegetable food. When vegetables were supplied the sick were cured, and the disease was arrested.

During the spring ensuing upon the severe winter of 1854, when the stock of potatoes was bad in quality or scarce, I recognized several cases of marked scurvy amongst the more destitute out-patients attending the London Hospital. But now, happily, we do not depend on the potato alone for our winter antiscorbutics. The skill of the gardener raises a large variety of plants of the cabbage tribe, celery, onions, and other leaves and roots, all useful.

We have, in addition, our home-grown fruits, apples being the most valuable of all. And to supplement these there has been of late years a profuse importation of oranges, a fruit of inestimable value to the public health, not only from its pre-eminent virtue as an antiscorbutic, but also because it comes over in perfection at the most opportune season of the year, namely in mid-winter and early spring. Here then we witness the conditions under which scurvy prevailed amongst the ordinary population on shore, and how it has been abolished. The cause and the effect, the disease and the preventive, are unmistakeably associated.

Scurvy appears whenever vegetables are not used.

But experience more conclusive still, swells up in overwhelming force. At many times, under many diversities of circumstance, isolated bodies of men have been subjected to the causes which generate scurvy, under conditions which fulfil the most rigorous requirements of scientific experiment. People have been cooped up in beleaguered towns, and soldiers have been secluded in garrisons, hospitals, barracks, or encampments, into which vegetables could not be conveyed. If this privation was continued for a few months scurvy has surely prevailed. A remarkable instance occurred during the siege of Breda in 1627. In this town scurvy broke out, and was at first taken for the plague, an error probably frequently committed in former times. The states of Holland had taken care to provide the place for a siege with rye, cheese, and dried fish. The rye was bad, and the flesh of dogs and horses was resorted to. The symptoms under which the inhabitants and garrison suffered are minutely described. They are identical with the disease, familiar at the present day to the staff of the Dreadnought Hospital. At one time an enumeration was made of 1,608 soldiers

labouring under it. A marked abatement was observed when green herbs began to grow up, and were made use of in decoctions. Again, during the siege of Thorn above 5,000 or 6,000 of the garrison, besides a great number of the inhabitants, died of this distemper, the surrender of the town being more owing to the havoc made by this dreadful calamity than to the bravery of the besiegers. This took place in the summer time; and the Swedes, the besiegers, having command of the produce of the country, kept altogether free from the scurvy. In the winter of 1759 the British troops in America suffered uncommon distress from this disease. General Murray reported that "constant "living on salt provisions, without any vegetables, introduced the "scurvy among the troops at Quebec." Above 1,000 died. The survivors were ultimately relieved by the use of onions and turnips, and especially spruce beer and green vegetables.

The early history of our American Colonies affords many remarkable illustrations. In Canada, Newfoundland, and Hudson's Bay scurvy was more fatal to the first adventurers than it was ever known at sea. When the use of vegetables came to be understood, scurvy disappeared, and Canada is now, perhaps, the healthiest country in the world.

Scurvy not dependent on absence of potash.

To prove that no climate and no epoch gives immunity from scurvy when the primary laws of diet are neglected, the disease still appears amongst the lumberers of Canada. Dr. J. O. Grant has described (Medical Times and Gazette, December 1863) cases observed amongst the Ottawa lumbermen. As in Scotland, it is popularly called "black leg." Dr. Grant found 25 men attacked out of 36 in one shanty. He attributes the disease in great measure to the free use of nitrate of potash in salting the pork which these men consume. That nitrate of potash is an efficient factor in the production of scurvy is a theory that will not stand before a comprehensive analysis of the various conditions under which the disease has arisen. But the fact cited by Dr. Grant is important as tending to prove the fallacy of the opposite theory advanced (1847) by Dr. Garrod, which places the cause of scurvy in the absence of salts of potash from the food.

Scurvy not caused by salt provisions.

To show that the use of salt provisions, *per se*, is by no means the cause of scurvy, we have abundant evidence. In the middle of the last century, when Sisinghurst Castle in Kent was filled with French prisoners, scurvy broke out among them, although from the time of their arrival in England they had eaten no salt provisions, but had been daily served with fresh meat and bread without vegetables. And so recently as 1836 scurvy prevailed amongst our troops at the Cape, who also had no salt provisions.

In the spring of 1823 scurvy prevailed in the Millbank Penitentiary. Doctor Latham showed that it was caused by a diet of which fresh succulent vegetables formed no part. Many similar instances occur in the reports of the Inspectors of Prisons for the years 1836, 1837, and 1838. In 1836 it assumed a very malignant form at Norwich Castle.

Scurvy prevailed severely in the General Prison of Leith in 1846-7. It arose from a dietary deficient in vegetable substances, and was removed when these substances were supplied.

Scurvy now unknown in prisons.

The excellent dietaries now adopted in our gaols, workhouses, and other public institutions have abolished scurvy, and to the present race of officials the disease is unknown.

Lieut.-Colonel Henderson, Surveyor-General of Prisons, says, "in "reference to your inquiry as to the existence of scurvy in the convict "establishments in this country and in Australia, as well as on board "convict vessels, I may safely state that the disease is unknown, and "has not existed for many years. Occasionally slight skin diseases

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" may have appeared; they did so at one time in Western Australia, " but they disappeared immediately on a change of diet. The health " of the convicts on board vessels bound to Australia, the voyage " occupying from three to four months, is remarkably good. During " the many years I was in West Australia the convicts landed, as a " rule, in excellent health. The scale of dietary on board ship is fair, " but not excessive; and a daily ration of lime-juice is served to each " convict, and he is made to drink it, but to make it palatable it is " mixed with a small quantity of Cape wine."

Scurvy in the army.

The fearful waste of life from sickness in the allied armies during the early part of the Russian war is a calamity still fresh in the memory. The fundamental disease, modifying and aggravating all the other diseases which prostrated our soldiers, was scurvy, and the cause was the want of vegetable food. The contrast between the health of the navy and that of the army was striking. Dr. Bryson, Director General of the Medical Department of the Navy, informs me, that although "there was more scurvy among the fleet in the Black Sea " than usual, the amount was of no importance in a service point of " view." The navy retained its efficiency unimpaired. This was due to the ships being well supplied with fresh vegetables and lime-juice. The army, under ordinary circumstances, has free access to vegetables, and is therefore not supplied with lime-juice. But here an unwonted deficiency of vegetables had arisen, and there was no lime-juice to compensate for the privation. The men suffered accordingly. Sir John M'Neill and Col. Tulloch inspected the condition of the army, and reported (June 10th, 1855,) that the food supplied during the winter 1854–5 consisted principally of salt meat and biscuit, with a very insufficient proportion of vegetables. The consequence was the prevalence of scurvy on a scale almost equalling in extent and severity anything that has been recorded in the annals of former wars. The disease began even in Bulgaria, where the troops subsisted for a long time exclusively upon salt meat and biscuit, an allowance of rice which they at first enjoyed having ceased after a time. In Balaklava the same diet continued, and of course with the same consequences. In several regiments, the reporters tell us there was hardly a man that was free from the scurvy. When at last the commissariat issued lime juice and vegetables, scurvy rapidly disappeared, and a fair standard of health was restored.

Scurvy at sea.

Scurvy at sea.—If we follow scurvy to sea, we find that the history of all the early voyages of discovery is replete with instructive examples of the cause and cure of this disease. During the celebrated expedition of Lord Anson in 1740 and the four following years, three ships which had left England with 961 men mustered at one time only 335; the rest had all died of scurvy. The crews were repeatedly restored by seizing opportunities of eating fresh vegetables. The disease pursued the squadron through all climates, through heat and cold, and in spite of fresh meat and fresh water. It was one of the rare merits of Captain Cook that in an age when hygiene was ill understood, when scurvy was considered a necessary condition of a sea-faring life, he accomplished the admirable feat of sending home his ship "Discovery" after an absence of more than four years without the loss of a single man. This signal success will alone preserve the memory of the great sailor. It was achieved by resolute adherence to rational principles. He took out a plentiful supply of sauer-kraut, and never lost an opportunity of landing his crews to gather wild celery and other plants, many of which were strange and even distasteful to the men. He was particularly zealous in collecting the

Scurvy prevented by Captain Cook.

green tops of the spruce fir, which he made into beer, and found to be an excellent antiscorbutic. In this manner he *prevented* scurvy, and this at a time when every long sea expedition was impeded or broke down through the losses occasioned by this disease. What Cook achieved others may imitate, and, from the multiplication of resources now everywhere at hand, with the certainty of success. But long after Cook's death scurvy was still the scourge of our fleets; frequently so reducing their force as to expose the country to imminent danger and disgrace. The records of the Royal Navy during the latter half of the last century abound with examples. Dr. Lind tells us that in August 1780 the squadron under Admiral Geary returned to Portsmouth, after a cruise of ten weeks in the Bay of Biscay, having 2,400 men affected by scurvy. Again, in 1795, scurvy broke out in the Channel Fleet under Lord Howe to such an extent as to endanger the safety of the whole fleet. The cause was that the winter had been extremely severe, and all vegetation in the neighbourhood of Portsmouth had been destroyed. When supplied with oranges and salads the crews rapidly recovered. Since that time lemon-juice has been regularly supplied to the navy. The effect was wonderful. The mortality fell, not gradually, but suddenly, to an extent scarcely credible. In the British navy scurvy now only appears under very exceptional circumstances, and the effective strength of our fleets has been immensely increased.

Recent history of scurvy in Royal Navy.

A remarkable instance of an outbreak of scurvy in the British navy occurred in the squadron serving on the South American coast in 1843, 1844, 1845, and part of 1846. I am indebted to Dr. Evan Evans, of Barbican, who served as surgeon on board the "Gorgon," for the following facts. Until September 1845 the "Gorgon" was almost constantly at Monte Video or Buenos Ayres, the crew nearly the whole time being supplied with the usual rations of fresh beef and vegetables. After September 1845 the supply of fresh meat was uncertain and scanty, and the supply of vegetables entirely ceased. Lime-juice was at this time not supplied in any quantity to ships in the River Plate, because it had scarcely ever happened that fresh provisions could not be procured. In November the "Gorgon" ascended the Parana, and about this time symptoms of scurvy were observed. The quantity of lime-juice in the ship was only sufficient to allow it to be given to those affected. One man died. The immediate cause of his death was effusion into the pleuræ and pericardium. This is a well-recognized effect of scurvy. No officers suffered. In December, vegetables, oranges, and fresh meat having been obtained, the scurvy disappeared. The allied French fleet suffered little or not at all, although placed under the same circumstances as regards fresh meat and vegetables. Dr. Evans believes they owed their escape to the fact that the crew were supplied with *French wine*, and that they had always *soft bread*. The immunity of the officers of the British fleet may also be ascribed to the greater variety of their diet, and to the use of wine and beer.

The prolonged abstinence from fresh vegetables which Polar expeditions have to undergo exposes the crews to scurvy. But even here extreme care, especially in providing preserved potatoes and other vegetables, postpones the appearance of the disease for a considerable time; a time far exceeding that during which any merchant ship has to remain at sea. Thus, in the second Polar expedition of Sir Edward Parry, scurvy showed itself only when they had been twenty-seven months in entire dependence upon the resources contained within the ship. And Dr. Armstrong, in his account of the voyage of the

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"Investigator," which left England in 1850, shows that scurvy was warded off for a period of two years and three months.

But the Royal Navy, serving under ordinary circumstances, is no longer subject to the invasions described. Dr. Bryson observes that "scurvy, as a disease of any importance in a service point of view, "has been banished;" and when he adds, that "there is reason to "think that a latent scorbutic condition modifies not unfrequently the "type of disease in the navy," he merely furnishes a proof of the constant vigilance that is required to preserve health under forced and prolonged subjection to a diet restricted in kind, and consisting of articles long in store.

Emigration Service. Captain Lean.

The ships of the Royal Navy are often exposed by the exigencies of the service to more prolonged risk of scurvy than are those of the Merchant Navy. How easy it is to prevent for a period of 90 or 100 days, a period beyond which merchant ships need rarely remain at sea without entering port, is seen from the experience of the emigration service. Captain Lean, the Superintendent of the Government Emigration Office, informs me that "their ships are remarkably healthy; "they often go out without a death; one just reported (January "1864) carrying about 300 souls has reached Melbourne without the "loss of one."

Scurvy in Merchant Service.

It is a lamentable fact, that notwithstanding the experience and in spite of the standing example of the Royal Navy and of the Emigration Service, scurvy is still suffered to prevail amongst the mercantile navy of this and other countries. There is reason even to believe that it is actually increasing instead of tending to abolition. Dr. Budd, who in the "Library of Medicine" has published the best treatise extant upon the subject, states that "during the space of a year and a "half, that he was physician to the "Dreadnought," he had to treat "nearly 50 cases of scurvy." Since that period (1837–8) the experience of the medical staff has been much larger. In no year of the last twelve has the number of cases of scurvy fallen below 51; and as will be seen in Supplement (B) the numbers were 51 in 1852, and 63, 124, 159, 91, 77, 77, 90, 77, 99, 64, and 86, respectively, for the following years terminating on the 31st December 1863. During these twelve years, there were, therefore, admitted a total of 1,058 cases of scurvy; an amount of misery to those afflicted, and of injury to the community, the more to be deplored since it is certain that it was entirely due to the wanton neglect of measures easy to observe. Nor does this figure at all adequately express the extent to which this frightful disease is manufactured. Only a certain proportion of the cases of scurvy entering the port of London find their way to the "Dreadnought." From inquiries instituted it appears that very few cases are admitted at the other metropolitan hospitals. But Mr. Corner, formerly physicians' assistant to the "Dreadnought," now surgeon to the Poplar Hospital and to the Home for Sailors, informs me that nearly half the men admitted to the "Home" are more or less affected by scurvy. This would give about 1,072 more cases for the last seven years (see Supplement (E.)

History of scurvy in Dreadnought Hospital.

To this must be added a large but uncertain number of cases taken into the low lodging-houses of the waterside. And London is but one port. On analyzing the "Dreadnought" records it comes out that the ships properly belonging to London are comparatively rarely attacked with scurvy. The ships which manufacture scurvy chiefly belong to other ports. Thus it is found, Supplement (D.) that during 1863, of the 86 cases entered, 14 belonged to London ships; 21 to Liverpool; two to Glasgow; eight to Sunderland; 10 to other British ports;

11 to Hamburgh; and 20 to other foreign ports. Now, as Liverpool ships may be presumed mostly to make Liverpool their homeward-bound port, it is reasonable to infer that that town will furnish a very large contingent of cases. It is a fact that stands out prominently, from observations made on board the "Dreadnought," that Liverpool, North Country, Hamburgh, and American owners exhibit the greatest amount of disregard of the safety and health of their crews. The plight in which the poor sailors from certain services are admitted is pitiable to witness. Disabled by hardship, semi-starvation, and ill-usage of every kind, they are cast out with the same indifference with which a worn out block would be thrown overboard.

The extent to which scurvy prevails amongst seamen is further shown by the large proportion which scurvy bears to other diseases. Thus, during the 12 years from 1852 to 1863, the total admissions to the Dreadnought amounted to 25,486. The scurvy cases were 1,058. This gives one case of scurvy in 24; that is, 42 cases in every 1,000 are strictly artificially-induced diseases.

Scurvy in Liverpool.

Inquiries made on short notice bring information, very imperfect, of the extent to which scurvy prevails in other British ports. Dr. Trench, the able Medical Officer of Health for Liverpool, however, has collected the following facts with regard to that town. There were admitted into the Liverpool Southern Hospital during the six years 1857–63, 228 cases, *Supplement* (F.)

Mr. M'Fall, the House Superintendent of the Liverpool Sailors' Home, states that at least one half of sick seamen go to hospitals. There came under his notice during 1863, 6,070 sailors from homeward bound ships. Of these about 100 were invalids and six were suffering from scurvy.

Mr. Murphy, Superintendent of the Out-door Staff of the Sailors' Home, states that scurvy is almost unknown, except in vessels from Africa and the East Indies. He places the average in those particular trades at two per cent. of the men.

Mr. F. D. Fletcher, Medical Officer of the Liverpool Workhouse Hospital, states that he does not think there have been more than half a dozen genuine cases of scurvy during the past three years in that institution.

Mr. Roberts, Medical Officer of the Liverpool Northern Hospital, states that the number of sailors suffering from scurvy admitted during 1863 was 10.

Dr. Inman, Physician to the Liverpool Northern Hospital, remembers two batches of 12 and 14 patients, all coming from the same ship. He estimates the sea-scurvy cases in the Northern Hospital at 60 in five years; to these, two cases of land-scurvy may be added, both very bad ones. The sufferers had been living on poor tea and bread.

Mr. H. G. Rawdon, of the Liverpool Royal Infirmary, states that 12 cases of scurvy were admitted into that institution during 1863. He further states that many slight cases apply for admission, but only the worst can be admitted.

From these returns it is seen that 50 cases, all probably severe, of scurvy, were admitted to the public hospitals of Liverpool during the year 1863.

The returns from other ports which do not possess a medical officer of health are less precise; but there is evidence enough to show that medical practitioners at most of our seaports are practically acquainted with scurvy.

Scurvy in Swansea.

Thus, Dr. Williams, F.R.S., Physician to the Infirmary at Swansea, has had six cases of scurvy under his care during the last four years.

He observes that the number of these cases in Swansea has been reduced to nothing; the copper-ore ships, which come round the Horn, being well stored.

Sir Henry Cooper, M.D., of Hull, says scurvy is not a common disease in that port, the reason being that the voyages are generally short.

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

John Wiblin, Esq., F.R.C.S., Medical Superintendent of the Quarantine, Port of Southampton, says, "With the exception of a single "instance, I have never witnessed or heard of any cases of scurvy in "the merchant navy connected with this port. The men on board the

Scurvy in Hull.

"vessel had suffered so severely that I reported their condition to the "coroner, and an inquest was held on one or two of the men who died

Scurvy in Southampton.

"after their arrival here, and a verdict of 'manslaughter' was given "against the captain. He was sent to Winchester Assizes for trial, "but was acquitted."

Scurvy in Bristol.

Mr. R. Norton, of the Bristol Dispensary, says scurvy cases rarely come under his notice or that of his colleagues.

Scurvy in Glasgow.

Doctor Leishman of Glasgow to whom I am indebted for the statistics of the Royal Infirmaries of Glasgow and Greenock, see Supplement K., says, "that without a systematic visiting of seamen's "homes and lodging-houses no real idea could be formed of the actual "proportion which scurvy bears to the general sickness-rate of a sea-"port town. You will see from the table that although the proportion "of cases in the Greenock Infirmary is larger than in Glasgow, it is "much less so than might have been anticipated. As regards scurvy "among landsmen it has been noted here that since the last great "failure of the potato crop there has been very little of it."

Doctor Leishman's returns show that 51 cases of scurvy were admitted into the Glasgow Royal Infirmary and the Greenock Infirmary during the six years 1857–1862.

The Dreadnought registers throw full light upon *the conditions under which scurvy arises.*

Ports whence scurvy ships come.

1. *The ports whence the scurvy ships come* are chiefly Shanghae, Calcutta, Bombay, Madras, Kurrachee, Colombo, and the Mauritius.

Duration of voyages producing scurvy.

2. *The duration of the voyages* producing scurvy varies from 56 days, as in the case of two men from San Domingo, to a maximum of 168 days, as in the case of an East Indian ship. In 49 out of 89 cases the number of days at sea exceeded 120. One ship from Kurrachee, which put 12 scurvy cases on board the Dreadnought, had been 117 days at sea. Inquiries have been habitually made with the view of ascertaining the earliest period after leaving port of the appearance of scurvy. It appears that symptoms, such as rheumatic pains, a peculiar gait, (the result of debility and brawny effusions in the hams,) blotches like bruises, swelling of the gums, lassitude and emaciation, and a peculiarly pallid tongue, the indication of destruction of the healthy red particles of the blood, have generally been manifest in from 60 to 80 days. Indeed it is proved that scurvy in an aggravated form may be developed in less than 60 days, by the fact that a Hamburgh ship, only 56 days from San Domingo, sent two bad scurvy cases on board the Dreadnought last year. Notwithstanding this early appearance of scurvy, it is not common to find that any effective measures have been taken to arrest it, or to preserve the health of those not yet affected. Captains, with half their crews more or less disabled, are known to run past St. Helena or the Western Isles, when a few hours delay would obtain sufficient fresh provisions to repair the mischief occasioned by first neglect. To check this wilful disregard of the welfare of their crews, it ought to be made a matter of greater pecuniary loss to the

owners to bring into port a scorbutic crew than to lose a day or two on the voyage. As it is, they contrive to throw the loss arising from their own parsimony and inhumanity upon others.

Nos. 6, 7. *Conditions of Nourishment.*

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

3. *The sanitary condition of the ships.*—Upon this point there is little information from personal examination; but it is not unreasonable to infer neglect of cleanliness and ventilation where there is known neglect of other hygienic rules. Indeed, the frequency of fever, rheumatism, phthisis, and other diseases arising out of or aggravated by bad food and lodging on board scurvy ships, affords sufficient evidence of the want of care in the general hygienic arrangement.

Sanitary condition of ships producing scurvy.

4. *Lime-juice.* In 23 cases it was stated that no lime-juice was served out; in most of the other cases it is certain that the lime-juice used was in very insufficient quantity, or so bad in quality as not to deserve its name. In one case, a single patient, 146 days from Calcutta, the man had refused to take lime-juice; another man, 150 days from Akyab, had also scurvy from the same wilful neglect; and a third similar case has been admitted in January 1864. These cases are decisive of the prophylactic virtues of lime-juice. They present all the characters of an *experimentum crucis*. All the crew but one take lime-juice, and preserve their health; the one who neglects taking it has scurvy. With reference to the quality of much of the lime-juice supplied to the merchant ships, it may be said that it is a manufactured article recommending itself to parsimonious owners by lowness of price. They do not care to remember that that only is cheap which answers its purpose. Dr. Bryson informs me that "the lemon-juice in the "merchant ships he knows from experience is often very bad." And we have had some very vile samples brought to the "Dreadnought." One consequence of this is to encourage scepticism in the efficacy of lime-juice, and thus to promote the spread of scurvy, under the delusion that the disease is unavoidable.

Lime-juice deficient or bad.

5. *The quantity and quality of provisions.* On looking over the Supplement (A.) it will be observed that the greatest diversity is reported in the quality of the water. In some cases the water was "good;" in others "bad;" in others, again, the water was "rain;" in others "condensed;" and in some cases the men were on short allowance. So it was with the meat. In most cases the meat was reported "good;" but in several instances the allowance was short. The great fault in the dietary of the merchant ships lies in the little variety of the articles supplied.

Quality of provisions.

The staple is salt beef, salt pork, flour, peas, biscuit, tea or coffee, sugar, and rum. There is certainly nothing injurious in these articles; at least nothing directly tending to produce scurvy. But the anti-scorbutic value of this diet as a whole is very small indeed; its defect is chiefly of a negative character.

The continued use of salt meat requires a large admixture of other substances to compensate for its limited nutritive qualities; and for this purpose the other articles enumerated are not sufficient. The scientific classification of foods into nitrogenised as serving for nutrition, and non-nitrogenised as serving for respiration, in favour among chemical physiologists, is very imperfect. The human body demands for the preservation of health a multitude of other elements, some indeed in very minute proportions, but not the less necessary, which only a varied diet embracing fresh vegetable food can supply. It is not only necessary to supply aliments from both organic kingdoms, and also from the mineral kingdom, but it is further necessary, especially in the case of animal food, to supply it in a proper form. Now although it has been found practicable to maintain men free from scurvy for

Vegetables necessary with salt food.

several months on salt meat when conjoined with vegetables, it is the opinion of physicians of the highest authority that the persistent use of salt meat predisposes to scurvy. Thus Dr. Bryson, who has kindly favoured me with the results of his valuable experience, says, "Scurvy "has been almost entirely banished from the navy; nevertheless I "think it would still occur if ships' companies were victualled entirely "on salt rations, and without vegetables, for three or four months "without intermission; but as most vessels have steam power this "rarely happens. Good lemon-juice and preserved or compressed "vegetables also assist much to keep it down."

Dr. Alexander Armstrong, R.N., also, in his excellent work on naval hygiene and scurvy (1858), expresses a decided opinion that salt meat diet facilitates the access of scurvy.

How salt meat is injurious.

The reason why salt meat so acts is thus explained: Liebig says, that in the salting of meat the flesh is rubbed and sprinkled with dry salt, and that where the salt and meat are in contact a brine is formed amounting in bulk to one-third of the fluid contained in the raw flesh, and that this brine contains the chief constituents of a concentrated soup or infusion of meat, and that therefore in the process of salting the composition of the flesh is changed. In salting the albumen is separated from the flesh; for when the brine is heated to boiling a large quantity of albumen separates as a coagulum. To what extent the nutritive elements of meat are extracted by salting may be further illustrated by the following fact, which I have repeatedly witnessed at sea: The meat served out is so strongly salted that it is sometimes put in a net and towed overboard for some hours. By this means the sea water, being a less concentrated solution of salt than the brine in the meat, a portion of the salt is washed out, and with it a large part of the nutritive juices of the meat.

The residual muscular fibre almost justifies the condemnation of Sir Gilbert Blane, who said that "salt beef and biscuit that have been "long kept do not contain much more nourishment than saw-dust or "the bark of a tree." A secondary and serious evil resulting from a diet restricted to salt meat and biscuit is, that as soon as scurvy has commenced the spongy bleeding gums incapacitate the patient from masticating. He must have "soft tack" and preserved meat, or starve altogether. We are told that the Crusaders, who often suffered frightfully from scurvy, were obliged to undergo the torture of having their swollen and ulcerated gums cut away by the barber before they could eat.

It is desirable to make one remark in reference to the indirect influence of salt meat and other causes in favouring the development of scurvy. It is quite true that scurvy has most frequently broken out in men who have been exposed to salt diet, cold, wet, overwork, bad clothing, bad lodging, and other forms of hardship and privation. But no one of these conditions, nor any combination of them, will suffice to produce scurvy if the sufferers are duly supplied with fresh vegetables. On the other hand, the only constant condition which has been observed in every outbreak, no matter how various the other conditions may have been, is the privation of vegetables; and the supply of this element has commonly alone brought relief, even in the face of the persistence of other unfavourable conditions. In this conclusion my colleague, Dr. Ward, concurs.

We now see scurvy expelled from the land, from the Army, from the Royal Navy, from the emigrant and the convict ship, from a large portion of the Merchant Navy, retaining its last hold in the forecastle of the ill-found merchant ship. The only victims of scurvy now are

the "common sailors," who, placing their health and their lives in the hands of unscrupulous captains, find both sacrificed to reckless cupidity.

To permit scurvy to break out in a ship's company is under ordinary circumstances, not only a sin against humanity, but an offence against the laws of the country. It is enacted ("Merchant Seamen's Act, 7 and 8 Vict. c. 112.) that whenever a crew shall have been consuming salt provisions for ten days, lime or lemon juice and sugar shall be served out at the rate of half an ounce each per day, and half a pint of vinegar per week." Experience has abundantly proved the sufficiency of this provision, if faithfully observed, to prevent scurvy during the voyages, rarely exceeding four months, of our merchant ships. In reality the warding-off of scurvy is only a question of 60 or 70 days, for within that time a ship sailing from Shanghae, for example, can always look in at some port and take in fresh vegetables. Since then the means dictated by the law are known to be sufficient, if scurvy makes its appearance the presumption is great that the law has been evaded. But we never hear of the penalty being enforced.

Scurvy result of neglect of the law.

Excuses or apologies of captains for scurvy.—1. It is alleged to be an unavoidable attendant upon long sea voyages and a diet of salt rations.

Excuses for occurrence of scurvy.

Facts abounding in this Report prove the fallacy of this assumption. One only is necessary to convict those who employ this subterfuge of bad faith. Scurvy may be prevalent in the forecastle, but it is *never known in the cabin.* If the captain and mates know how to preserve themselves, they know how to preserve their men, and they ought to be made to do it.

2. It is no uncommon thing for captains to affirm that their men, suffering from scurvy, are in truth suffering from syphilis, a disease which, contracted by their own fault, disentitles them to their wages. To this it can be answered that the symptoms of syphilis and scurvy are too distinct to admit of being mistaken by medical men, and further that syphilis will not induce scurvy.

3. It is affirmed that lime-juice is of no use. This excuse is much relied upon by Hamburgh owners und captains. Hamburgh ships rarely carry lime juice; but then they constantly point an argument against themselves, for in no ships is scurvy so frequent as in theirs. Thus out of 11 Hamburgh ships which sent scurvy cases to the Dreadnought last year, not one was supplied with lime juice. Since they have so little success in keeping away scurvy without lime juice, they would surely do well to try it before condemning it as useless.

4. It is affirmed that lime juice is sometimes spoiled by keeping. Experience, attested by ample evidence, proves that lime juice, properly prepared, will preserve its antiscorbutic virtues for years in all climates.

Evil effects of scurvy.—When it is remembered that the security of this country has on several occasions been imperilled by the disablement of the Royal Navy through scurvy, it may be presumed that the same cause will imperil the safety of our merchant ships. And there can be no doubt that many ships have actually foundered at sea because the crews were so prostrate from scurvy as to be unable to handle them when overtaken by severe weather. It has been the custom to inquire what proportion of the crews were disabled by scurvy. As might be supposed, in the case of a disease resulting from a cause operating upon the entire crew, this proportion is often very large. Thus there were recently admitted on board the Dreadnought

Evil effects of scurvy.

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

12 cases of severe scurvy from one ship; two others were known to be seriously affected; and the entire complement of officers and men was only 19, leaving but five men in all able for duty to work the ship.

Similar cases are not uncommon. It will be seen from Supplement (C.) that the proportion of the crew disabled has ranged from 20 per cent. to 70 per cent. Now when it is borne in mind that scurvy is the direct result of parsimony on the part of the owners, expressing itself in the saving of the cost of a little lime juice at the sacrifice of the men they employ, it is in the highest degree probable that these are the owners who will follow the maxim "not to carry more "cats than will catch mice" with the greatest rigour.

Affects a large proportion of crew.

It is certain then that scurvy-ships have rarely a hand to spare. Deprive such ships of a fourth, a half, or two-thirds of their force, and the peril of ship, cargo, crew, and passengers in stress of weather is obvious. A crew of five men, for example, could not reef topsails or bring the ship to in a gale of wind. And it must not be forgotten that where scurvy has prostrated a large part of the crew the vigour of the remainder is sure to be sapped, so that there may not remain a single sailor before the mast in a state of thorough efficiency.

Endangers life and property.

It cannot be doubted, further, that scurvy, being one result of the recklessness of owners and captains in regard to the health and lives of seamen, is a great cause of demoralisation amongst sailors. This in itself is a serious evil.

The physical deterioration of sailors from exposure to the modified starvation which culminates in scurvy is difficult to estimate. It is certainly very great. The constitution that has once yielded to scurvy is so far damaged that any latent predisposition to other disease, as to phthisis, is apt to acquire ascendency, and to hurry the victim to an untimely end. Of those who recover, many do so but imperfectly. We have seen exfoliation, or decay and loss of portions of the jaw and other bones, large ulcers, which in the process of repair leave contractions that impede the free play of the muscles, effusions of blood and fibrin in the hams, which do not altogether disappear; and often a state of debility remaining for a long time. Before the sailor can perfectly recruit he is commonly driven to sea again, perhaps to be exposed at increased risk to the same evils which caused his first illness.

The less favourable hygienic condition of the Merchant seamen as compared with the seamen of the Royal Navy is also expressed in the greater mortality of the former.

Mortality amongst merchant seamen.

The late Dr. M'William, R.N., (*See* Supplement I.,) from the most careful examination of the records of the Registrar-General of Seamen, aided by his personal experience, estimated the deaths in the Merchant Service during the nine years 1852–1860 at 18·98 per 1000 per annum. And this is far from representing the total loss. The deaths of seamen occurring ashore in foreign parts are not included; and the number of these is probably large. On the other hand, the deaths in the Royal Navy (*See* Supplement G.) during the six years 1856–1861, afloat and ashore, amounted to 18·3 per 1000 per annum only. The difference in favour of the Royal Navy is much greater than would appear from these figures.

The observance of sound hygienic laws, and especially the providing of an adequate antiscorbutic diet, concerns the health of upwards of 170,000 British sailors, not to mention the sailors of foreign countries, whose chief hope of improving their condition depends upon the example and the stimulus afforded by the progressing welfare of their English brethren.

Nos. 8, 7. *Conditions of Nourishment.*

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

The measures to be observed in order to prevent scurvy in Merchant ships.—If the Merchant Seamen's Act (1835) of Sir James Graham, which Doctor M'William described as the Magna Charta of British Merchant sailors, were faithfully observed by masters and owners, scurvy and much sickness of other kinds would be abolished. The enactments of that Act as to stores and lime-juice are generally sufficient. The fault lies in the absence of any effective control to secure the observance of the Act. The sailors themselves know not how to turn their Magna Charta to account for their own protection.

Measures for the prevention of scurvy in merchant ships.

It appears,—1. That some organized system of inspection of the stores as to quantity and quality of Merchant ships is necessary before permitting them to leave port.

Inspection of merchant ships necessary.

The inspection of ships as to the quality and quantity of stores and medicines is obviously defective. The Merchant Seamen's Act provides (Section 57.), "That it shall be lawful for any Consul or Vice-"Consul of Her Majesty, and for any Collector or Comptroller of the "Customs, *upon complaint made by any three or more of the crew*, to "survey and examine or cause to be surveyed and examined *the* "provisions, water, and medicines put or supplied on board any ship "for the use and consumption of the crew; and if on such survey it "shall be found that such provisions, water, or medicines are of a bad "quality, or unfit for use, or not appropriate, &c., the surveying officers "shall signify the same in writing to the master of the ship; and if such "master shall not thereupon provide other fit and proper provisions, "*&c., he shall* in each and every of such cases be guilty of a misde-"meanour."

To make inspection contingent on complaint of three of the crew is an insufficient enactment, for the following reasons:

a. The crew would not be likely to find out that the provisions were deficient until some time after leaving port, and after they had actually suffered from the default; that is, too late for the purposes of prevention.

b. Sailors are seldom found ready to enforce their rights against masters in a matter of this kind. It would be as reasonable to defer the inspection of an unhealthy house until the poor inhabitants complained. If this were done, few of the immense sanitary improvements carried out of late years in the metropolis would have been effected.

What the Merchant ships want is systematic inspection, such as is provided for emigrant ships, and private passengers ships before sailing.

2. A medical inspection of the ship's crew, the sanitary state of the ship, and remaining stores, should be made on the ship entering port.

3. That the master of every ship should be required to enter in his log a record of every case of sickness on board during the voyage, and that this record should be examined by a medical officer on returning to port.

4. That the penalties named in the Merchant Seamen's Act for neglecting to carry a proper supply of lime-juice be enforced.

5. That the existence of scurvy on board a ship should be regarded as primâ facie evidence of culpable neglect, which should subject the Master to a Court of Inquiry, as to the victualling of his ship, and the means he may have taken to prevent or cure scurvy.

6. Owners and masters of scurvy-ships should be held personally liable in damages to the sailors whose health, their only possession, is injured. If a parent or a master in any position ashore suffers a child or servant to perish or be injured in health, by wilful neglect to supply

proper food, they are liable to a criminal prosecution. It has occurred to me that a sailor who has contracted scurvy through the negligence of his owner or master has good ground for an action for damages. But sailors are not the kind of men to try a question of this nature for themselves.—

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes.

7. In every case of a sailor dying of scurvy a coroner's inquest should be held. If a man die of scurvy it is absolutely certain that he has been starved; in the case of a sailor at sea, or returning from a voyage, it is presumable that he has been starved by those who had contracted to keep him in food, and that, therefore, the guilt of "manslaughter" probably lies at somebody's door. Inquests are often held in the case of persons dying ashore from cholera or fever, where no individual is to blame. The indication and the utility are much greater in the case of scurvy.

More varied diet necessary in merchant ships.

8. That exclusive dependence should not be placed upon lime-juice as an antiscorbutic; that the dietary of merchant ships should embrace a greater variety of articles.

I believe that great good would result from the adoption of the dietary enforced in the case of emigrants, and extended to the crews of emigrant ships. This dietary provides preserved meats instead of salt meat on two days in the week; a considerable variety of bread stuffs; eight ounces of preserved potatoes, and three ounces of preserved carrots, turnips, onions, celery and mint; and an allowance of pickles, with three ounces of lime-juice weekly.

I believe that instead of rum, which has no antiscorbutic virtue, it would be better to supply bottled ale, or light French, Cape, or Australian wine; and I would especially recommend the spruce-beer which Captain Cook found so efficacious. A receipt is appended for making it.*

No opportunity should be lost of getting fresh oranges, lemons, shaddocks, or cocoa-nuts. Captain Carteret, a distinguished navigator of the last century, declared that the upper part of the cocoa-nut tree, called the cabbage, was perhaps the most powerful antiscorbutic in the world, and found that the water of the nut recovered his men very fast.

Another most useful article for a long sea voyage is "sauer-kraut."

9. The neglect to carry a proper supply of antiscorbutics, if resulting in the production of scurvy and the loss of the ship, should vitiate the policies of insurance. I do not find that underwriters or marine insurance offices insist upon the observance of the provisions of the Merchant Seamen's Act, which form the best security for the safe navigation of the ship. Perhaps such a condition is implied. But surely it is a matter worthy of consideration whether, when a ship is lost at sea, it being proved that there was scurvy on board, the owners who have broken the law of the land should be entitled to recover against the insurers, who took the risk on the assumption that the law was observed.

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* The essence of spruce is prepared by boiling down to concentration the young branches of the Black Spruce Fir (Abies Nigra). Take of this essence half a pint, pimento and ginger, bruised, of each four ounces; water, three gallons. Boil for five or ten minutes; then strain, and add, of warm water, eleven gallons; yeast, a pint; molasses, six pints. Mix, and allow the mixture to ferment for twenty-four hours. It is an admirable antiscorbutic, and is an agreeable and wholesome drink in warm weather.

"Dreadnought." From Mr. HARRY LEACH, Resident Medical Officer.

Date of Admission.	Name of Patient.	Ship.	Of what Port.	Days at Sea.	From	As reported by Patients.		
						Limejuice.	Quality of Water.	Meat.
1863.								
Jan. 3	Roberts, John	Europa, F.	Bath, U. S.	—	Calcutta	Good	—	Good.
" 3	Mitchell, Joseph	Veteran	Liverpool	127	Bombay	Do.	Bad	Do.
" 2	Williams, Henry	Assyrian	Aberdeen	129	Shanghai	Do.	Good	Do.
" 3	Tate, Henry	Veteran	Liverpool	127	Bombay	Do.	Bad	Do.
" 3	Quirk, Benjamin	Do.	Do.	127	Do.	Do.	Do.	Do.
" 3	Darghty, Bernard	Do.	Do.	127	Do.	Do.	Do.	Do.
" 6	Andrews, Henry	Bosworth	Sunderland	165	Calcutta	None	Do.	Short allowance.
" 6	Jones, James	Jane Leech	Liverpool	139	Do.	Good	Do.	Good.
" 7	Donovan, Dennis	Bosworth	Sunderland	167	Do.	None	Do.	Short allowance.
" 8	Gray, James	Pegasus	Liverpool	135	Shanghai	Bad	Do.	—
" 11	Bellboning	Peeress	London	—	Madras	None	Good	—
" 11	Everson, James	Bonnie Dundee	Liverpool	—	Calcutta	—	Bad	Good.
" 14	Walter, Rodolph	Glimea	London	168	Tuticoin	Good	Good	Do.
" 30	Homuth, Carl	Delphin, F.	Rostock	—	Minititlan	—	—	—
Feb. 2	Nicholas, John	Wave of Life	Aberdeen	140	Melbourne	Bad	Bad	Bad.
" 10	Alier, George	Revenue	Jersey	127	Calcutta	None	Do.	Do.
" 26	Zander, Philip	Prega, F.	Hamburgh	—	Bombay	Do.	—	—
March 1	Whincup, George	Continental	Bombay	—	Do.	Do.	Condensed	Good.
" 6	Assaman	Donald M'Kay	Liverpool	—	Batavia	Do.	—	—
" 20	Hamilton, James	Northumbria	Newcastle	120	Madras	Bad	Good	Good.
" 20	Evison, John	Mahartta	Liverpool	110	Calcutta	Good	Bad	Do.
" 23	M'Crindle, Thomas	Speedy	London	130	S. America	Do.	Do.	Do.
April 1	Ross, William	Eudora	Sunderland	130	Shanghai	Little and bad	Good	Bad.
May 5	Braden, William	Isabella	Boston, ?	134	Calcutta	None	Bad, R.	Good.
" 5	Allen, Richard	Do.	Do.	134	Do.	Do.	Do.	Do.
" 31	Peutar, George	Juunna	London	120	Persian Gulf	Good	Very bad	Very good.
June 3	Serphein, William	Polomaise	Glasgow	128	China	Little	Good	Bad.
" 10	Schultz, Osten	Henrietta, F.	Hamburgh	96	Buenos Ayres	None	—	—
" 12	Reilly, William	Virgilia	Shields	107	Colombo	Bad?	Bad	—
" 12	Eller, Mousen	Do.	Do.	120	Do.	Good	Bad, R.	—
" 5	Noton, James	Gala	Glasgow	180	Kurachee	—	Good	Bad.
July 23	Maloney, James	Menzies *	Liverpool	140	Colombo	Very bad	Do.	Good.
" 24	Shepherd, Charles	Do.*	Do.	140	Do.	Do.	Do.	Do.
Aug. 19	Kulbron, Otto	Wilhelmsburg, F.	Hamburgh	143	Penang	None	Do.	Do.
" 19	Berndorf, James	Do.	Do.	143	Do.	Do.	Do.	Do.
" 20	Stevens, Harry	Do.	Do.	143	Do.	Do.	Do.	Do.
" 20	Aalss, Wilhelm	Do.	Do.	143	Do.	Do.	Do.	Do.
" 20	Michel, Gustaf	Do.	Do.	143	Do.	Do.	Do.	Do.
" 28	Steward, George	Alice Ritsen	Sunderland	135	Calcutta	—	Do.	Do.
" 28	Gleuge, William	Horizon	Liverpool	146	Do.	Do.	Do.	Do.
						Good, but patient did not take it.		
Sept. 2	Lyach, William	Sultana	Do.	124	Colombo	Bad	Do.	Do.
" 7	Ready, Michael	Ameliora	Blyth, nr. Sunderland	71	Taganrog	None	Half rations	Do.
" 27	Frederick, Hansen	Calcutta	Plymouth	128	Tuticoin	Good	Chiefly rain	Do.

F. Foreign.

R. Rain water.*

APPENDIX.

Nos. 6, 7. Conditions of Nourishment.

7. Sea-scurvy in Merchant Service, by Dr. R. Barnes

A.—TABLE showing every CASE of SCURVY admitted during an entire year (1863) into the Hospital Ship "Dreadnought."—*cont.*

Date of Admission.	Name of Patient.	Ship.	Of what Port.	Days at Sea.	From	As reported by Patients		
						Limejuice.	Quality of Water.	Meat.
1863.								
Oct. 2	Harrison, William	Crimea, F.	Kentucky	135	Rangoon	None	Bad	Good.
„ 2	Shaw, William	Iona	London	60	Lagos	Good	Do.	Do.*
„ 5	Reid, James	Laventa	Limekilns, Leith	70	Porto Rica	Do.	Good	?
„ 7	Fudge, John	Flying Spur	London	126	Foo-Chow-Foo	Do.	Condensed	Good.
„ 8	Wolas, Charles	Lam, F.	United States, A.	135	Akyab	None	Good	?
„ 20	Gillies, Hugh	Challenger	London	126	Shanghai	Good. Half rations	Do.	Good.
„ 24	Lindroon, Auguste	Do.	Do.	126	Do.	Do.	Do.	Do.
„ 26	Jones, Charles	Do.	Do.	126	Do.	Do.	Do.	Do.
„ 31	Haem, Peter	Shakespeare	Annan, Solway Firth	131	Foo-Chow-Foo	—	Do.	Do.
Nov. 4	Buer, John	Fortuna, F.	Oldenburgh	100	Lagos	None	Do.	Do.
„ 6	Herring, William	Emperor	Sunderland	100	Shanghai	Good	Do.	Do.
„ 6	Baker, James	Do.	Do.	160	Do.	Do.	Do.	Do.
„ 6	Taylor, William	Do.	Do.	160	Do.	Do.	Do.	Do.
„ 7	Friedricks, Herman	A. Busig, F.	Hamburgh	56	San Domingo	None	Do.	Do.
„ 7	Janssen, Auguste	Do.	Do.	56	Do.	Do.	Do.	Do.
„ 7	Miller, Peter	Cuba, F.	Do.	71	Mauritius	Do.	Do.	Bad.
„ 9	Smith, James	Tamar	London	125	Kurachee	?	Bad	Good.
„ 11	Thomas, Owen	Binnea	Liverpool	124	Calcutta	?	Bad	Half rations.
„ 11	Wiggins, William	Tamar	London	125	Kurachee	Did not take it	Bad	Good.
„ 15	M'Donald, Thomas	Earl Canning	Liverpool	150	Akyab	No limejuice from 6° S. latitude.	Good	?
„ 18	Curran, William	Punjaub	London	149	Kurachee	Did not take it	Do.	Good.
July 1	Barron, George	Ardencraig	Liverpool	110	Mauritius	Bad	Bad	Bad.
„ 1	Pope, Thomas	Do.	Do.	110	Do.	Do.	Do.	Do.
„ 1	Driscoll, John	Do.	Do.	110	Do.	Do.	Do.	Do.
„ 1	Smith, Thomas	Do.	Do.	110	Do.	Do.	Do.	Do.
June 9	Theissan, John	Henrietta, F.	Hamburgh	96	Buenos Ayres	None	—	—
Nov. 24	Rennie, David	Bengollyn	Liverpool	163	Calcutta	Bad	—	Bad.
Dec. 3	Templeton, John	Charlotte and Jane	London	150	Cochin	? taken irregularly	Good	Do.
„ 16	Petter, Johan	Java	Stockholm	—	—	—	—	—
„ 26	Moignord, John	Blue Jacket	Liverpool	115	Calcutta	Good. Only half rations given.	Condensed	Bad.
„ 27	Sankonen, Jacob	Salo, F.	Uleaborg	117	Kurachee	Good. Taken irregularly.	Bad. Rain	Good.
„ 27	Laitrom, August	Do.	Do.	117	Do.	Do.	Do.	*Do.
„ 27	Tusana, Jacob	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Rand, Isaac	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Galeunes, Johan	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Kramsen, Andrew	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Rosna, Johan	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Glusa, Agash	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Hildunen, Harry	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Herman, Henric	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Falk, Andrew	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 27	Heikinen, Abel	Do.	Do.	117	Do.	Do.	Do.	Do.
„ 30	Rice, George	Hannah	London	128	Madras	Good	Good	Good.

SUPPLEMENT B.—SUMMARY of ENTRIES and CASES of SCURVY admitted from 1852 to 1863 inclusive into the Hospital Ship "Dreadnought." From MR. HARRY LEACH, Resident Medical Officer.

Years.	In-Patients.	Cases of Scurvy.		
				Per Mille.
1852 -	2,294	No. of Cases	51 -	1 in 45 = 22
1853 -	2,524	"	63 -	1 in 40 = 25
1854 -	3,007	"	124 -	1 in 24 = 42
1855 -	2,171	"	159 -	1 in 13 = 75
1856 -	1,907	"	91 -	1 in 21 = 47
1857 -	1,877	"	77 -	1 in 24 = 42
1858 -	1,979	"	77 -	1 in 26 = 38
1859 -	1,807	"	90 -	1 in 20 = 50
1860 -	1,721	"	77 -	1 in 22 = 45
1861 -	2,285	"	99 -	1 in 23 = 43
1862 -	1,880	"	64 -	1 in 29 = 35
1863 -	2,034	"	86 -	1 in 23 = 43
	25,486	"	1,058 -	1 in 24 = 42

SUPPLEMENT C.—TABLE showing NAMES of SHIPS importing SCURVY to LONDON, and the NUMBER of the CREWS, and Proportion affected. From MR. HARRY LEACH, Resident Medical Officer of the *Hospital Ship "Dreadnought."*

Ship.	Number of Officers and Crew.	Number affected with Scurvy.
		Proportion per Cent. affected.
Fortuna - Foreign	8	2 = 25
Emperor - -	13	5 = 38
Cuba - Foreign	15	3 = 20
Tamar - -	21	4 = 25
Bianca - -	36	7 = 20
Earl Canning -	21	9 = 43
Punjaub - -	24	7 = 20
Bengollyn - -	38	8 = 21
Salo - Foreign	19	14 = 70
	195	59 = 31

SUPPLEMENT D.—Showing PORTS to which SHIPS importing SCURVY belonged. From MR. HARRY LEACH, Resident Medical Officer of the Hospital Ship "Dreadnought."

Ship's Port of Register.	Number of Cases of Scurvy received in 1863 from Ships of different Ports.	No Lime-juice.
London - - - -	14	1
Liverpool - - -	21	1
Glasgow - - -	2	-
Sunderland - -	8	3
Other British Ports -	10	2
Hamburgh - -	11	11
Other Foreign Ports -	20	5
Total - -	86	

SUPPLEMENT E.—RECEIVED into the SAILORS' HOME, POPLAR, as INMATES. (From Mr. Corner, see p. 336.)

	Number.
From June 7th to Dec. 31st, 1857	387
,, Jan. 1st to Dec. 31st, 1858	354
,, Jan. 1st to Dec. 31st, 1859	315
,, Jan. 1st to Dec. 31st, 1860	213
,, Jan. 1st to Dec. 31st, 1861	208
,, Jan. 1st to Dec, 31st, 1862	367
,, Jan. 1st to Oct. 27th, 1863	300
Total	2,144

The one half afflicted with scurvy 1,072.
The one twentieth seriously so, or about 50 to 60.

SUPPLEMENT F.—SIX YEARS' RETURN of CASES of SCURVY admitted into the LIVERPOOL SOUTHERN HOSPITAL. From FULSTON WOLLASTON, M.D., Senior House Surgeon.

	Cured.	Relieved.	Died.	Total.
1857	55	4	—	59
1858	60	5	3	68
1859	13	—	—	13
1861	27	—	1	28
1862	24	3	3	30
1863	26	—	2	28
	205	12	9	226

The greater number of cases occur in seamen engaged in the East India Trade or in the West Coast of Africa Trade.
The cases terminating fatally were principally those of old men.

SUPPLEMENT G.—From DR. BRYSON. The GENERAL MORTALITY in the ROYAL NAVY for six years, from 1856 to 1861, the period of the new series of Statistical Reports, was as follows:—

1856	-	15·5 per 1,000.
1857	-	19·4 ,,
1858	-	25·5 ,,
1859	-	16·7 ,,
1860	-	14·7 ,,
1861	-	18·3 ,,

There were two deaths from Scurvy in 1859, and one in 1850.

SUPPLEMENT H.—From DR. BRYSON. SCURVY in the ROYAL NAVY.

Cases	-	1854	-	139 or 10·7 per 1,000 Black Sea only.
,,	-	1855	-	60 or 4·1 Ditto.
,,	-	1856	-	
,,	-	1857	-	28·7
,,	-	1858	-	4·9
,,	-	1859	-	49·1
,,	-	1860	-	

SUPPLEMENT I.—TABLE showing the TONNAGE, FORCE, and DEATHS in the MERCHANT NAVY of the UNITED KINGDOM (taken from a paper by the late Dr. M'William, R.N., C.B., F.R.S., in the Transactions of the Social Science Association, 1861.)

Years.	Tonnage.	Force.	Deaths.	Ratio per 1,000.
1852	3,380,884	159,563	2,205	13·82
1853	3,730,087	172,526	3,276	19·05
1854	3,729,093	162,415	2,772	17·06
1855	3,990,170	168,537	3,313	19·68
1856	4,156,077	173,918	3,549	20·40
1857	4,211,482	176,387	3,444	19·56
1858	4,325,242	177,832	3,486	19·60
1859	4,269,109	172,506	3,430	19·68
1860	4,251,739	171,592	3,760	21·91
		Average	3,241·88	18·98

SUPPLEMENT K.—RETURNS of the GLASGOW ROYAL INFIRMARY and of the GREENOCK INFIRMARY. Supplied by DR. LEISHMAN of Glasgow.

	Glasgow Infirmary.		Greenock Infirmary.	
	Total in Medical and Surgical Wards, exclusive of Fevers.	Scurvy.	Total, excluding Fevers.	Scurvy.
1857	2,915	5	239	2
1858	2,736	11	348	2
1859	2,729	3	326	1
1860	3,139	10	368	—
1861	3,394	3	366	2
1862	3,657	10	484	2
	18,570	42	2,126	9

Nos. 8–12.—INDUSTRIAL DISEASES.

No. 8.—REPORT by DR. GEORGE WHITLEY on the OCCURRENCE of LEAD-POISONING among PERSONS who work with LEAD and its PREPARATIONS.

8. Of Workers with Lead, by Dr. Whitley.

Form of report.

As regards the form of the following report, I have thought it would prove most convenient to take, one after the other, the several chief occupations which have to do with lead or its preparations, giving, with regard to each, first (wherever necessary) a description of the industrial process which is in question, then such evidence as was obtainable concerning the amount and severity of lead-poisoning amongst the work-people, and lastly the apparent causes of any increase or decrease of such poisoning experienced by them. Having completed this detailed account of the individual occupations, I shall add a few remarks concerning the general results of the inquiry, and the means taken to obviate any ill effects arising to the work-people.

Persons having to do with lead.

The persons chiefly exposed to danger of lead-poisoning in connexion with their occupations are :—1st, smelters ; 2nd, manufacturers of various preparations of lead ; 3rd, potters ; 4th, painters ; 5th, plumbers ; 6th, printers; 7th, type-founders ; 8th, shot-makers ; 9th, enamellers of visiting cards and dial-plates ; 10th floor-cloth manufacturers; 11th, glass manufacturers, and some others in whose cases the exposure appeared too slight to call for any special inquiry.

A.—The OCCUPATIONS which have to do with LEAD and its VARIOUS PREPARATIONS.

Smelters.

1. *Smelters.*

Though aware that inquiry had already shown that, with the precautions now very generally adopted in the smelting of lead, the workmen do not suffer from lead-poisoning, the kind offer of T. Sopwith, Esq., F.R.S., chief director of the great lead-works at Allen Mill in Northumberland, to obtain information from medical men as to the condition of the workmen at an earlier period, appeared to promise some evidence of interest in connection with the present inquiry. From these gentlemen I learnt that before the introduction, some years ago, of flues of great length, through which the fumes produced during the process of smelting are made to pass, and in which they become condensed, the workmen suffered extensively from lead-poisoning. Under the present system, however, by which the workmen are no longer exposed to the action of these fumes, while large quantities of lead are saved to the owner of the works, it was stated that cases of lead-poisoning are no longer met with. I was also informed that the same state of things prevails at some lead-works of less extent in Derbyshire; and as the same arrangement which protects the workmen also adds to the profits of the smelting, there seems to be no danger of ill-effects hereafter from this branch of lead-industry.

Makers of various preparations of lead.

2. *Manufacturers of various preparations of lead.*

Makers of white lead.

(*a*) Manufacturers of white lead.

Having been distinctly refused by one of the larger London manufacturers permission to visit his works, and having been given to understand that I should meet with a similar refusal from other London houses, I went to Newcastle-upon-Tyne, where I was permitted to inspect thoroughly two of the largest manufactories of white and red lead and of shot. The manufacture of white lead, or carbonate of lead, is doubtless one of the branches of lead industry in which the work-people suffer the most from their occupation, but even here it appears

that if they would strictly observe the precautions suggested the ill effects would be comparatively slight.

A short description of the process of manufacture will show why certain parts of it are more detrimental to those employed than others.

A number of earthen vessels are prepared, into each of which a few ounces of crude vinegar or pyroligneous acid are poured, rolls or plates of sheet lead are then introduced in such a manner that they shall neither touch the vinegar nor project above the top of the jar. The vessels are next arranged in a large building, side by side, upon a layer of spent tan, and closely covered with boards. On these boards a fresh layer of tan is placed, and the whole process repeated until a pile of many alternations has been constructed. The building is now closed, and a spontaneous process set up, the exact nature of which is not well understood, but after many weeks the stack is taken to pieces, and, under favourable circumstances, the greater portion of the metallic lead is found to have been converted into a carbonate. This then only requires to be washed and ground to be fit for use. The unpacking of these stacks is usually performed by women, who have to separate the carbonate from any unconverted metallic lead. Formerly the metallic lead was put into the earthen vessels entirely in rolls, which required more handling to separate the carbonate than the flat plates now chiefly used. After being ground wet, the white lead is dried in ovens, whence it is afterwards carried by women, to be packed in casks by men, and is then ready for the market.

The stops of this process most injurious to the work-people are,—the unpacking of the stacks, the transport of the dried article to the casks, and, above all, the packing in the latter, as it has to be stamped down with a kind of beetle, that the casks may be properly filled, in consequence of which a considerable quantity of the powder becomes diffused through the atmosphere.

It is generally believed that the white lead affects the work-people, partly by inhalation and partly through the skin. The inhalation appears, however, to be the more fertile source of evil, if we may conclude from the small extent to which the dippers in the potteries, whose arms up to the elbows are immersed in glazes containing lead for hours consecutively, suffer from lead-poisoning.

Although every facility was afforded me in the Newcastle lead works, I could not ascertain from any of the foremen or others the actual amount and severity of lead-poisoning occurring amongst the work-people, beyond the general assertion that a decided decrease has taken place of late years, which was attributed to improved sanitary arrangements, to be further alluded to in a later portion of this report. I was therefore glad to learn that a medical man was attached to each of these establishments; but the first of these upon whom I called refused to give me any assistance in my inquiry. The other, Mr. J. B. Fife, was of opinion that no amount of precaution would entirely obviate the ill-effects arising from two, at least, of the processes in the manufacture of white lead, viz., to the women who take the lead from the stacks and drying ovens, and to the men who pack it in casks. Mr. Fife could not give me the exact number of cases which had occurred during the years of his experience of these works, but stated that he observed several cases in the course of a year amongst about 240 men and women. The most usual form is colic, generally pretty easily cured; but in some cases he found it necessary to prohibit the continuance of the occupation, which he often found it difficult to carry out, as the cases were frequently those of young girls receiving high wages, and contributing to the support of other members of their family. Mr. Fife had seen very few cases of paralysis or

cerebral affections arising from lead-poisoning, but stated that gout, or rather rheumatic gout, is common, though the extent to which this disease exists is difficult to ascertain, as the period of service varies from a single day to many years. The impression that persons working in lead are often the subjects of some such form of disease appears very general, but no exact information could be obtained on this point. Mr. Fife believes the blue line to be very common in persons who have been long employed at these works. He was of opinion that much of the mischief arose from neglect of the simple printed precautions hung up in various parts of the establishment, and that the owners did all in their power to render the occupation as little unhealthy as possible. I was shown two bath-rooms, well arranged, for the use of the work-people, but informed that but little advantage was taken of them, especially in winter. The owners also expressed their willingness to build a room for a Turkish bath, if thought expedient.

All the evidence obtained in Newcastle, including that of two of the physicians of the Infirmary, was to the effect that cases of lead-poisoning have been less frequent of late years, and all agreed in attributing this decrease partly to improved processes of manufacture, partly to sanitary precautions, however deficiently carried out.

(*b.*) Manufacturers of red lead.

Makers of red lead.

The manufacture of red lead appears to be much less detrimental to the health of those employed in it than that of white lead.

Metallic lead is introduced into melting ovens provided with an opening at the top and two or three at the sides. Through the latter the workmen, provided with long iron rakes, stir the melted lead, kept at a low red heat, thus constantly exposing fresh surfaces until the whole becomes oxidised. This product is then washed, partially dried, and returned for further exposure to heat and atmospheric air in the ovens. The required degree of oxidation having been attained, the red lead is then washed, dried, and packed in casks. The red lead differs from the white in having little tendency to cake or to fly about in fine powder, and as there is much less need for touching it in the various processes of manufacture, and as the packing is accomplished without stamping it down, I was not surprised to hear that the workmen suffer very little in this branch. Several of the men whom I questioned seemed to think that with ordinary attention to cleanliness their occupation exposes them to very little danger of lead-poisoning.

(*c.*) Manufacturers of sugar of lead.

Makers of sugar of lead.

On inquiring for manufactories of this sort, I was at first told it was imported entirely from abroad, chiefly from France; then that it was made at Limehouse, which proved to be no longer the case; and lastly, that it was made in this country, exclusively in Swansea and the surrounding district. Dr. Williams of Swansea informs me, however, that after careful inquiry he has been unable to ascertain the existence of any such manufactory in that neighbourhood. I was unable, therefore, to get direct evidence on this point, but have good authority for believing that the workmen suffer much from lead-poisoning in this branch of manufacture, though chiefly from the neglect of precautionary measures.

Potters.

3. *Potters.*

The various kinds of glaze used in the manufacture of fine and common porcelain contain white or red lead in varying proportions. In some kinds, such as the common white or pearl glaze, there is as much as one third of white lead. The best white glaze contains about one eighth of white lead, and the best china glaze about one ninth of

lead, in a less deleterious form, it is believed, viz., partly in the form of red lead which has been fired.

The persons exposed to danger from this source are the men called "dippers," and, in a less degree, the boys who assist them. The glaze containing the varying proportions of lead mentioned above is a fluid of the consistence of thickish cream. Into this the man dips each article, and considerable experience is said to be required to do this properly, so that the same men remain at this work often for many years. The hands and arms as far as the elbows are thus covered with the glaze for about eight hours a day, four or five days a week. The boys remove the articles when dipped, to be placed in coarse earthen vessels, and exposed to intense heat in closed ovens. No inconvenience appears to arise from this latter process. The number of dippers is small. Thus at Mr. Alderman Copeland's manufactory, which I was allowed to inspect most thoroughly, there are usually about five dippers, while at many of the smaller manufactories which I visited I found one or, perhaps, two only. Some of those I examined had been dippers for many years, but two only acknowledged that they had suffered from lead-poisoning, and that but slightly. Many of them, however, believed that the dippers suffered more formerly, which they attributed to the circumstances that less lead is used now in the glazes, and no arsenic, and that the lead used is in a less deleterious form, being more commonly burnt (fretted) than it used to be. In several of these men I found the blue line on the gums slightly marked.

4. *Painters.*

Painters.

Although the idea of lead-poisoning as an industrial disease, especially in the form of the so-called "painters' colic," appears so closely associated with this class of workmen, I had great difficulty in obtaining any satisfactory data in reference to the amount of such disease amongst them.

At Mr. Fish's, Avery-row, New Bond-street, the intelligent foreman of 18 years standing could remember no case of drop-hand during that time, and only one severe case of colic. The average staff here consists of about 50 painters and seven plumbers. My informant believed that there had been much less lead-poisoning of late years, partly from increased cleanliness, and the adoption of a different dress by the men, and partly because painted walls are so much less common now than formerly. He stated, further, that he should have known if any other cases had occurred amongst their men.

Mr. Beard, Carey-street, Lincoln's-Inn, who had been in the business since 1828, informed me that he had seen no case of drop-hand for many years, and but few slight cases of colic. He believed, however, that these affections were much more common formerly, and attributed the decrease to the same causes as my last informant. Here also the average staff was about 50 men.

Dr. Craske Webb, Pimlico, who had been for seven years surgeon to a Painters' Benefit Society of about 32 members, stated that he did not remember more than three cases of lead-colic during that time, of which one only was severe, and no case of drop-hand.

The modification of dress amongst painters mentioned above consists in the adoption of an entire outer suit of washable material, to be worn only in working hours. This is meant to be washed at least every week, and is generally regarded as a great improvement upon the former custom of wearing a suit of clothes until it became coated with paint, which suit was often not changed after the men had finished their work.

5. *Plumbers.*

Plumbers.

At the extensive establishment of Messrs. Beard and Dent, Newcastle-street, Strand, the manager stated that the average number of men having to do with lead there was about 75, and that he only remembered one case of drop-hand for many years, and very few of colic. He added that very few men ever lose a day's work there, and that the employment is not considered unhealthy, in confirmation of which he showed me the books of a sick fund amongst the men, from which it appeared that in 1862 there had been 14 cases on the list, of which one only was entered as lead-colic, and in 1863 11 cases in all, no case of lead-poisoning. In some years the number of men contributing to this fund amounted to 100. It was believed, however, that lead-poisoning was formerly more common amongst plumbers, and the decrease was attributed partly to the substitution of machinery for hand-labour in various processes, and partly to improved habits of cleanliness amongst the men. For the encouragement of the latter, convenient opportunities for washing had been afforded in the workshops. Here, as in several other places where the work-people have to do with lead, an impression prevails that phthisis is very rare.

The foreman of plumbers at Messrs. Lucas had not seen a case of drop-hand for many years. He stated that he heard of cases of colic occasionally in men doing inside work, but not more, perhaps, than one in twelve months.

At Messrs. Cubitts', Gray's Inn Lane, amongst about 45 men working in lead, I heard of only two cases of lead-colic having occurred for several years.

6. *Printers.*

Printers.

Mr. Adlard, Bartholomew Close, who had taken much interest in the question of lead-poisoning, asserted to occur occasionally amongst compositors, believed that this affection is now extremely rare amongst them, if indeed it occur at all. On inspecting his staff, many of whom had been so employed for a great number of years, some of the older men stated that such cases sometimes occurred formerly, when it was the custom to distribute the type in a wet state. The men were in the habit of drying this type at open fires, and the occasional cases of lead-poisoning which occurred were believed to result from handling the metal in this warm and moist condition. The same statement was made at several other large establishments. The type is now distributed dry, and open fires are no longer used for warming the rooms in which the compositors work. I heard of no case amongst Mr. Adlard's men for several years.

At Messrs. Bradbury and Evans', with a staff of about 150 compositors, the manager, who had been there 30 years, could only remember one case of lead-poisoning, which occurred soon after he came, when the type was still distributed wet. A compositor, who had been here 40 years, had known three or four cases, under the same circumstances, but none of late years. Further information on this point, obtained from secretaries of Printers' Benefit Societies, in reference to large numbers of workmen, having confirmed the above statements, I deemed it unnecessary to push the inquiry further.

7. *Type Founders.*

Type Founders.

On visiting three of the largest type Foundries in London, it appeared that a few cases of lead-poisoning occur amongst the workmen, almost entirely, however, amongst the rubbers, or men who dress or finish the type, by rubbing each side of it on a stone.

At the first foundry I visited, where about 150 men and 80 boys were employed, I could only hear of two cases of drop-hand, which were

stated to have occurred many years ago. A medical man, who had been attached to this establishment for 15 years, and had just given up practice on account of ill-health, stated that lead-colic was rather frequent, chiefly among the rubbers, but warned me not to attach much importance to his statement, as his memory was impaired, and he had no records to refer to. The mode in which the rubbers are believed to suffer is from having particles of the type-metal under the nails, an evil which may no doubt be obviated to a considerable extent by cleanliness. Moreover, at one of the foundries which I visited, this process is now performed by machinery. There was only one melter employed, who had been so engaged for 17 years, and had never suffered from lead-poisoning.

At the second foundry I visited, two cases of drop-hand were said to have occurred in rubbers about 20 years ago, but I could not hear of any cases of lead-colic, though I questioned three of the men who had been there from 32 to 51 years. The staff here amounted to about 160 men and boys. At a third foundry, with a staff of about 100 men, the foreman stated that three cases of drop-hand had occurred in the last 17 years. A man who had worked there for 50 years remembered very few cases of any form of lead-poisoning, and had never suffered himself. At none of these establishments was sulphuric acid known as a preventive.

Previously to inspecting these foundries I was led to suppose that a greater amount of lead-poisoning occurred amongst the workmen; and having been informed that large type foundries exist in Glasgow and Edinburgh, I requested Dr. Gairdner, Medical Officer of Health for the former place, to render me some assistance on this point.

That gentleman writes, that from all he can learn lead-poisoning is extremely rare in Glasgow, and that the experience of his colleagues at the Infirmary did not furnish any evidence of its prevalence among type founders. The information he kindly obtained for me from the two type foundries in Glasgow was to the same effect.

8. *Shot-makers.*

Shot-makers

On visiting a large manufactory of shot at Newcastle-on-Tyne, I found no history of lead-poisoning amongst the workmen, and the exposure to such danger appeared very slight. The process which would appear most likely to prove detrimental is probably that of melting the lead, which takes place, on an average, not more than twice a week. A small quantity of arsenic is mixed with the lead, to give a more perfect spherical form to the shot, and cases of arsenical poisoning are recorded by some writers; but the danger from this source appeared very slight. The mixing of the metals in the first instance takes place in closed furnaces, whence the metal is allowed to run into moulds. When the shot is made, one portion of this mixed metal is melted with several times its weight of pure lead. This process is carried out at the top of the shot tower, and as it occurs, as already stated, only about twice a week, and ventilation is easily attainable, the probability of danger to those engaged in it appears very small.

9 *Enamellers.*

Enamellers.

(*a*) Enamellers of visiting cards.

Enamellers of visiting cards.

The number of persons employed in this work was formerly considerable, but of late years not only has the demand for the article itself decreased very much, but other substances have been substituted largely for the white lead then employed.

I visited three of the largest houses in London likely to furnish evidence on this subject, but at one only did I find that the white lead

8. Of Workers with Lead, by Dr. Whitley.

is still used. The manager, who had been there 18 years, said he had never known a case of lead-poisoning amongst their work-people. They only employ men whom they believe to be both careful and temperate. The number employed in this work does not exceed six. Formerly some women were employed in this work, but they also remained free. The white lead is ground and mixed on the premises, but no mixer was known to have suffered from lead-poisoning, though mixing with his hands. This appears to confirm the notion that it is chiefly by inhalation that white lead proves detrimental. Sulphuric acid is not used here as a preventive, but the men occasionally take an aperient of their own accord.

Enamellers of dial-plates.

(*b*) Enamellers of dial-plates.

White-lead is used in the formation of the glaze on clock-faces. After some search I succeeded in finding a house in Clerkenwell where this process is carried on, but when I was told that the whole number of men engaged in it anywhere probably did not exceed a dozen, and that they had never heard of a case of lead-poisoning from this cause, I thought it useless to push the inquiry further.

Makers of floor-cloth.

Floor-Cloth Manufacturers.

Preparations of lead are used largely in the manufacture of floor-cloths; but the mixing of the colours for which they are required takes place wet, and the men have very little occasion to handle them; consequently, on visiting a large manufactory in Southwark, and questioning some of the men who had worked there for many years, I was not surprised to find that they had never known a case of lead-poisoning from this cause.

Glass-makers.

11. *Glass-Makers.*

A considerable amount of red lead is used in the manufacture of flint glass; and when the various materials required to form the "batch" or mass to be fused into glass are mixed by hand, and ordinary attention not paid to cleanliness, cases of lead-poisoning may no doubt occur. At a very large manufactory which I inspected at Newcastle-on-Tyne, the "batch" is now mixed by machinery in a closed room, and neither the proprietor, nor any of the work-people whom I questioned, knew of any cases of lead-poisoning having occurred here. The only way in which it appeared likely that the men should suffer from this cause being from allowing the red lead to remain constantly beneath the nails and about the hands, in other manufactories, where the mixing of the "batch" is still probably done by hand, I did not think it advisable to spend more time on this portion of the inquiry.

This completes the list of occupations which appeared worthy of investigation in reference to lead-poisoning.

B. Summary of Results.

Number of persons engaged in lead industry.

1. The number of persons employed in the various occupations which have to do with lead being very considerable, the amount of injury to health arising therefrom is a question of great interest.

Danger from these occupations.

2. In a very few only of these occupations does the amount of danger from lead-poisoning appear to be at all serious, while in the others very little inconvenience is felt.

Possibility of rendering this danger very slight.

3. Even in the more dangerous occupations it appears that the full adoption of the precautionary measures either prescribed or suggesting themselves naturally would render this danger very insignificant, except for persons peculiarly sensitive to the poison, an evil to be obviated only by ceasing to follow the employment.

4. I found it impossible, within the limits of this inquiry, to ascertain the average number of persons suffering from lead-poisoning in the

various branches of lead industry, inasmuch as this could have been effected only either by questioning all the persons employed at the establishments I visited (a process not to be carried out in many cases without a great sacrifice of time, if at all) or by the assistance of medical men. Of the latter I met with only four or five connected with Benefit Societies or directly with lead works, and not one of them could furnish me with any exact data on this subject. As, however, all the evidence, medical or other, was to the effect that a considerable decrease has taken place of late years, both in the number and severity of such cases, and as, from the tendency to introduce machinery in place of hand labour in many of the processes, and the better understanding of the value of sanitary precautions, it appears probable that this decrease will be progressive, an extension of the inquiry seems scarcely necessary.

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Average number of persons affected.

5. The form of lead-poisoning by far most commonly met with is colic, while cases of drop-hand or other forms of paralysis appear to be rare. The only fatal case of supposed epilepsy from this cause, mentioned to me, was that of a man who had died suddenly at one of the Newcastle lead-works, a few days before my visit; but I afterwards ascertained from the medical man who was called in that he had died of sanguineous apoplexy.

Forms of lead-poisoning.

6. I made no attempt to ascertain the actual mortality from lead-poisoning for the whole country, or for a number of years in reference to any portion of it, this not appearing to come within the scope of my inquiry; but the fact that the number of deaths from this cause registered in the London District for 1862 amounted to eight will give some idea of the proportion.

Mortality from lead-poisoning.

7. The chief predisposing causes to lead-poisoning mentioned everywhere are intemperance and want of cleanliness. To these may be added, an unusual susceptibility in some individuals, and, probably, any depressing causes acting upon the system.

Predisposing causes.

8. The chief precautionary measures for persons employed in lead industry generally are—temperance; the use of an outer dress of some washable stuff, to be taken off after work; cleanliness, especially careful washing of the mouth and hands before taking food, which should never be taken in the work-rooms; the occasional use of aperient medicines; and free ventilation. Respirators would most probably be useful in cases of inhalation of the poison, but, as is stated in reference to persons having to do with mercury, the work-people can seldom be induced to wear them.

Precautionary measures.

Besides this, it is desirable, in the manufacture of white lead, that machinery should be employed as much as possible where dry grinding is unavoidable; that this process should be carried out in closed chambers, with a current of air passing *into* the openings through which the white lead is introduced; and that all the processes of grinding, pulverising, packing, &c., should, when possible, be performed wet.

In manufacture of white lead.

9. While it appears almost certain that the full adoption of the above precautions would reduce the amount of lead-poisoning amongst persons employed in the various branches of lead industry to a minimum, it is only just to the principals generally to state that the neglect of those precautions lies almost exclusively with the work people themselves. Since, therefore, except in cases where the neglect of the precautions prescribed endangers the lives of others, as in the case of coal-miners, the work-people cannot well be actually compelled to adopt them, there appears to be no call for legislative interference in reference to any of the branches of lead industry.

Indications for legislative interference.

APPENDIX. Nos. 8–12. *Industrial Diseases.*

No. 9.—REPORT by DR. GEORGE WHITLEY on the OCCURRENCE of MERCURIAL POISONING among PERSONS who work with MERCURY and its PREPARATIONS.

9. Of Workers with Mercury, by Dr. Whitley.

The persons chiefly exposed to danger of mercurial poisoning in connexion with their occupations are; 1st., water gilders; 2nd., silverers (looking-glass makers); 3rd., barometer-makers; 4th, furriers.

Persons having to do with mercury.

A.—The OCCUPATIONS which have to do with MERCURY and its VARIOUS PREPARATIONS.

Water-gilders.

1. *Water-gilders.*

The term water-gilding is applied to a process in which the gilding is really effected by means of heat. Some other metal, generally copper, is first brushed over with a solution of nitrate of mercury, then covered with a layer of an amalgam of gold and mercury; the articles are then heated by the workmen over a charcoal fire, to expel the mercury, and afterwards burnished. During this process the workmen are exposed to the fumes of the mercury, and suffer, with few exceptions, sooner or later, from mercurial poisoning. When the objects to be gilt are small, the charcoal fire is placed beneath the opening of a chimney, the upward draught through which is intended to carry off the fumes of the mercury, and a glass-sash is interposed between the workman and the object to be exposed to heat, a small opening only being left at the lower part of the sash for his arms. Despite these precautions, the poison in this particular form, that of the vapour of metallic mercury, is apparently so subtle that men employed in this work rarely long escape some ill-effects. When the objects to be gilt are larger, the use of the glass-sash has to be dispensed with, and the danger is increased very much. Fortunately this mode of gilding has been superseded to a great extent by electro-plating, but I was informed that it cannot yet be entirely abandoned.

I visited three establishments in London where water-gilding is still carried on to the greatest extent. At the first of these, which may be considered large at the present time, I found that the greatest number of men usually employed in this process did not exceed five or six, and that they were seldom engaged in it more than two or three days a week. A workman of 30 years' standing there said that the number he had known to be so employed during that time did not probably exceed three dozen. He believed all these men had suffered more or less from mercurial poisoning. He had suffered himself, but not severely. At the time of my visit, though actually engaged in the process, which he showed to me, he seemed in good health, with the exception of a slight questionable amount of tremor.

The principal at the second house confirmed the above, both as regards the circumstance that most of the men suffer sooner or later, and the necessity of not allowing them to work in this branch more than two or three days a week. He told me he was hesitating just then about accepting an extensive order to gild large objects for a staircase, because he feared the men would suffer severely.

At all three houses I was told that there are, besides the workmen so employed there, a few who carry out the process in a small way in their homes, and are sometimes driven by necessity to work more constantly at it. They believed that these men suffer very much, but I had no means of finding out such cases, nor did it appear likely to answer any useful purpose to do so. It seems, however, that the whole

number employed in water-gilding is very inconsiderable, as I was informed that the process is carried on to a slight extent only anywhere out of London. I heard of no death at any of the places.

2. *Silverers.*

The number of men employed in the silvering of mirrors is considerable, but fortunately the danger of mercurial poisoning arising from their occupation appears much more capable of obviation by the adoption of certain simple precautions. In this case the poison seems to be in the form of an oxide of the metal diffused through the atmosphere of the worshops, and entering the system either by inhalation, or through the skin, or even with the food in those who neglect to wash their hands carefully.

The process of silvering is as follows:—A sheet of tin-foil is laid upon the stone silvering table, and carefully flattened; a large quantity of metallic mercury is poured upon this, and the sheet of glass to be silvered is slid over the surface of the tin-foil in such a manner that a portion of the mercury intervenes regularly everywhere between them. The excess of mercury which it is necessary to use in this process runs off the table into vessels from which it is taken to be strained, and rendered fit for further use. Some of the mercury thus running off has formed an amalgam with a portion of the tin-foil, and thus become more capable of oxidation at ordinary temperatures. A greyish-looking powder observable on the tables, and a large quantity of scum on the top of the mercury in the receiving vessels, show that the amount of oxidation thus induced is considerable.

I visited six or seven establishments of this kind in London, and one in Newcastle-upon-Tyne, in most of which I saw reason to believe that the conditions under which the people work have been improved greatly of late years. Formerly the business was in the hands of a much smaller number of employers, and the work appears to have been done in closer workshops, while the people were employed in it more continuously than at present. Notwithstanding the present improved state of things, it was very generally admitted that cases of mercurial poisoning from this cause still occur, but when occurring in in the well-managed workshops are believed to depend chiefly upon intemperance and want of cleanliness in the work-people. I was informed, however, that a certain amount of silvering is done on a small scale, for the production of articles of low price, by persons, chiefly Italians or Jews, at their own houses. These persons are believed to suffer severely, and I took considerable pains to find out some of them, but without success.

A short summary of the information obtained at one of the largest establishments I visited will suffice to give an idea of the present state of things in this branch of mercury industry. The principal, who afforded me every facility in my inquiry, stated that the average number of persons usually employed there in the process of silvering was nine men and one boy. About 30 others were less directly employed in it. The employer did not know of any death having occurred for the last 50 years from mercurial poisoning contracted in his service. He was fully aware that cases of mercurial poisoning had been frequent formerly, and still occurred, but he shewed me the great improvement in their workshops by increasing their height and the ventilation in them, and stated that they engage no men of known intemperate habits. No well-marked case had occurred for many years among men who had worked there only, and

he believed that in well-arranged workshops, with cleanliness and temperance, the danger, except to those peculiarly sensitive, is not great. Young men, on first commencing this work, however, especially those from the country, generally suffer slightly from salivation or ulcers about the mouth during the first month. Convenient opportunities for washing are provided on the premises. He suggested that the evidence of a certain number of employers like himself might, however, be taken as to the conditions under which alone it should be lawful to carry out the process of silvering.

All that I observed in most of the other places I visited served to confirm the above, but in one or two, the workshops were less capacious and worse ventilated.

Barometer-makers

3. *Barometer-makers.*

The chief moment of danger from mercurial poisoning in this branch appears to be the occasional bursting of the tubes in which mercury is heated. When this occurs the same vapour of metallic mercury is probably diffused through the atmosphere as in the case of water-gilding, though not so continuously. The danger, therefore, naturally appears less, and this view of the case was fully confirmed by Mr. Negretti, who most willingly gave me every information on this subject, in which he seemed to take much interest. He stated that he did not think that there were more than 100 men employed in this particular work in the whole country, and that, with temperance and cleanliness, cases of mercurial poisoning are exceedingly rare amongst them. He mentioned an interesting case of severe affection of this kind which had come under his notice several years ago, and had been cured without the man's giving up his work, by taking a bath daily. Such a case appears to be strongly in favour of the theory that the elimination of some metallic poisons, especially lead and mercury, occurs chiefly by the skin.

4. *Furriers.*

My attention was directed to mercurial-poisoning in this business by the following circumstances:—About three years ago a woman came to the Surrey Dispensary who was suffering from such salivation as usually results from the long-continued action of small quantities of mercury on the system. As she denied having taken mercury medicinally, I looked for some other source of the mischief, and was told that she was employed at a furrier's near the Dispensary, in dressing skins which had been treated with some fluid which she believed contained mercury. She said that the women who have to do with the skins after the preparation has dried on them suffer more from this cause than the men who apply it wet. She stated that several women had been thus affected at that establishment, and brought me a young woman a few days after whose condition was very similar to her own, and who also distinctly attributed it to her occupation.

The following fatal case occurring in Guy's Hospital appears to have resulted from the same cause, except, perhaps, as regards the particular salt of mercury employed in the process of dressing the fur.

R. B., furrier, was admitted into Guy's Hospital, December 10, 1863. He was formerly a footman at Clapham, and had always enjoyed good health. Four years ago he first began his present occupation, which consists simply of packing the fur, after it has passed through many

other hands, in bags. For the first three years he was not much inconvenienced by the mercury, beyond feeling some general debility. After that time he found he could not hold his hand steady enough to shave himself, and was soon unable thoroughly to control his muscles. He trembled considerably when standing upright, and four or five months ago began to have slight spasmodic movements when in bed. He continued his occupation, however, until obliged to give it up a month ago. On admission, he stated that his gums had never been sore, and that he had never had any metallic taste in his mouth. Two or three days after his admission he became delirious, grew gradually weaker, and died exhausted, December 23.

I have given this somewhat lengthy extract from the notes kindly furnished me by the clinical clerk, because, on inspecting thoroughly the establishment at which the man had been employed, I found scarcely any evidence of even slight cases of mercurial poisoning having occurred there, even amongst persons apparently much more exposed to such danger than himself. The case will be very fully commented on in the next volume of the Guy's Hospital Reports; but I may mention here that Dr. Alfred Taylor found mercury in various tissues of the man's body, especially the kidneys, and that the fur which he was in the habit of packing proved on analysis to contain a considerable quantity of mercury.

If this man's death resulted from the cause here assumed, the most plausible explanation would appear to be an extreme sensibility to the action of the poison, with, perhaps, an unusually low power of eliminating it from the system.

A short description of the process in use at the place where the man worked may serve to elucidate this question. The skins, which are those of the common rabbit, or of a kind of American musk rat, the nutria, are brushed on the hairy side with a solution of nitrate of mercury. This is done by men, of whom there are eight or nine so engaged here. The skins are then dried in a closed heated room. They are then brushed by machinery, which is served by boys. Of these there are usually three. Some of these boys have been thus employed daily for three or four years, but I could not hear of any case of mercurial poisoning amongst them. The skins are then cut by machinery, and afterwards sorted. This is done by women, who have to handle the fur constantly. There are about 50 so employed, but I could not ascertain that any of them had ever suffered from mercurial poisoning. One of them who had been there 43 years told me she had never heard of a case until the one mentioned above occurred.

At a similar establishment in the same neighbourhood I was also allowed every opportunity for inquiry, but did not hear of any case of this kind.

At the establishment where the two women worked whose cases are mentioned above I was not allowed either to inspect the premises or to ascertain what preparation was usual in dressing the skins. As regards the latter point, one of the principals professed to be too ignorant of chemistry to know whether any mercury was used, while he refused to allow me to ascertain this for myself. I was told, elsewhere, however, that red precipitate is used there in lieu of nitrate of mercury. If so, this would probably be rather more deleterious than the nitrate. I am inclined to think, however, that cases of mercurial poisoning from this cause must be very rare there, as neither one of the physicians at the dispensary, who has been there 11 years, nor a

practitioner in Bermondsey, who has been much at this establishment, and attended some of the people connected with it, could remember ever to have seen such a case.

Some preparation of mercury is at present considered indispensable to render the fur fit for manufacturing purposes.

9. Of Workers with Mercury, by Dr. Whitley.

I am not aware of any other occupations in which the persons employed incur any serious danger of poisoning by mercury.

B. SUMMARY OF RESULTS, &c.

Number of persons engaged in mercury industry. Danger from occupations. Number of persons affected.

1. The number of persons employed in the various occupations which have to do with mercury is much smaller than in the case of lead industry; but the danger of mercurial poisoning, in two of them at least, renders the investigation one of much interest.

2. The chance of obviating the danger from mercurial poisoning among water-gilders appears to be very small, as it was stated that few escape altogether, even when only working two or three days a week. Fortunately, as already stated, their number is small, and may be expected to decrease still more.

The number of silverers is much greater, but the amount of suffering, with ordinary precautions, comparatively slight. In the two other occupations to which my inquiry extended the number of persons affected appears to be very small.

Forms of mercurial-poisoning. Mortality.

3. Salivation, or the appearance of ulcers about the mouth, is a usual but not constant result in persons when first exposed to the action of mercury in their occupations. This is followed, at a period varying from some months to many years, by the characteristic mercurial tremor, which, when severe, compels the men to abandon their work in many cases, at least for a time. Death from this cause appears, however, to be very rare.

Predisposing causes.

4. The same predisposing causes appear to exist here as in the case of lead-poisoning.

Precautionary measures.

5. All the precautions suggested for persons employed in the various branches of lead industry are applicable here. The use of respirators would also probably diminish the danger from inhaling the metallic fumes or oxide of mercury, but it was frequently stated in the course of both my inquiries that the work-people can seldom be induced to wear them for any considerable length of time.

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10. Of Dressmakers and other Needlewomen in London, by Dr. Ord.

No. 10.—REPORT by DR. WILLIAM ORD on the SANITARY CIRCUMSTANCES of DRESSMAKERS and other NEEDLEWOMEN in LONDON.

Milliners and dressmakers. Their number.

The following report, although referring chiefly to milliners and dressmakers, includes some information respecting the condition and health of other persons earning their living by the use of the needle.

The milliners and dressmakers, as far as regards social position, may be conveniently classed together. But it must be understood that they follow distinct branches of employment, and that, in some respects, they are subject to different conditions.

In the report of the Children's Employment Commission of 1842, their numbers are estimated by Mr. Grainger at 15,000. It is difficult

to estimate their numbers correctly; but it may be stated that the names of 1750 dressmaking houses are inscribed in the Post Office London Directory, and that, giving an average of 10 workers to each, the number 17,500 is obtained.

In the Census of 1861 the number of milliners and dressmakers in the metropolitan area is given as 54,870, among whom will be included those women who work singly at home, or go out to work at the houses of private persons; so that the number 17,500 may be considered to represent fairly the proportion of milliners and dressmakers employed in the large and small houses of the City, West End, and Suburbs, as distinguished from the isolated workers who abound in the back streets of the City and West End, and in the Suburbs.

The dressmakers constitute the more numerous body, and may be first described.

Two classes of dressmakers.

They are divided into two classes; those, namely, who board and sleep in the houses of their employers, and those who, living at their own houses, go to and from the houses of business at fixed hours,—the day workers. The latter constitute for the most part an inferior class, and are less regularly employed.

Their grades, and system of promotion.

Girls enter the houses of business as apprentices, at 14 or 15 years of age. In the best houses they pay premiums ranging from 10*l.* to 50*l.*; but in the inferior houses, recruited by girls of an inferior social position, this practice does not exist.

The apprenticeship, during which they of course earn nothing for themselves, lasts two years, after which they are called improvers.

As improvers they are supposed to have mastered the drudgery of the trade, and are put to more extended and more varied work. After six months or a year spent in improving, they begin, according to their proficiency, to receive salaries of 6*l.*, 8*l.*, or 10*l.* per annum, still living in the houses of business, and receiving the title of assistants.

The next grade is that of the second hands, who are promoted from among the assistants of two or more years standing, and receive salaries of 20*l.* to 25*l.* per annum, the rapidity of promotion depending upon the skill and good taste of the girls.

The designing, cutting out, and arrangement of work, the reception of customers, and the control of the workrooms, are in some cases undertaken by the employers; but are more generally left to forewomen, who are called first hands, and in the large houses where there are several work-rooms the first-hands are again placed under the orders of a superintendent.

The proportion of salaried and unsalaried workers varies very much in different houses.

The number of apprentices found in London houses is comparatively small.

In the best houses very few apprentices or improvers are to be found, their skill not being equal to the delicate work therein required; but in the inferior houses they are much more numerous; and many girls remain in such houses just long enough to enable them to be worth a salary, when they seek employment in the better establishments. Altogether, however, the number of apprentices appears very small in proportion to the number of salaried workers, a circumstance which is partly explained by the fact that large numbers of girls come up yearly to London seeking employment as assistants or second hands, after completing their apprenticeship in the country. From such circumstances it follows that in many of the largest and most fashionable houses of business,—those which are most subject to great pressure of work in the season,—there are few girls to be found under 20 years of age, a fact of great importance in considering the effects of long

hours of toil upon the inmates of such houses. In one large West End house, employing 35 resident young persons, I found that there was only one girl as young as 17. She was then employed in the showroom, though subject to be required at times to work with the needle. Of the girls employed in the workrooms, few were under 20 years of age.

In another house, one of the most fashionable at the West End, of 35 in-door workers only one was an apprentice, aged 17; the rest were all more than 18 years of age, and were for the most part nearer 30 than 20.

Condition of young persons in houses of business.

The hands living in the houses of business are of course subject to various treatment, as regards hours of work, food, and lodging, according to the liberality of their employers. The day workers, on the contrary, are everywhere subject to much the same conditions, and will be treated of separately.

In-door hands; their hours of work.

With regard to the most important subject of the hours of work, most contradictory assertions are made. But without attaching too much importance to statements of extreme protraction of work hours, it may safely be said that the hours of work are generally too long, and so arranged as to give few opportunities for bodily exercise. In a considerable number of houses the arrangement appears to be as follows:—

After breakfasting at 8 A.M., the girls commence work at 8.30 A.M., and continue, with an interval of half an hour for dinner, and another half hour for tea, till eight or nine o'clock at night. In the season these hours are much extended; and, on the other hand, in the slack time, at the end of summer, they are shortened by one or two hours. The workrooms are in some instances closed earlier on Saturday, namely, at 4 or 5 P.M. From this account, which is carefully guarded from exaggeration, it will be seen that the ordinary hours of work are from 10 to 12 hours, exclusive of meal times.

But, as before stated, the hours of work are much lengthened during the season. The London spring season commences in the end of March or the beginning of April, and lasts till about the middle of July; but there is also a shorter and less important season in the end of the year, namely, in part of November and December. In a large number of houses the earliest time of quitting work during the season, is 10 or 11 o'clock, and under the pressure of court ceremonials, the work is often carried on far into the night.

But in order that this question be fairly understood, it is necessary to submit for their lordships' information, a few statements and opinions as to the length of the hours of work.

Miss Newton, the secretary to the Dressmakers Aid Association, who is able to speak from many years experience with reference to the condition of dressmakers, and from whom I have obtained much valuable information, informs me that the hours of work are nothing like what they used formerly to be. She considers that the hours are generally from 8 A.M. to 9 or 10 P.M.; but that these are liable in the season to be much exceeded. "In fact," to use her own words, "the "girls must work any hours during the season."

In houses of mixed business.

In a large house of business, combining a large and fashionable shop for the sale of uncut and made-up material, with a special dressmaking and millinery department, the hours of work were stated by the employers to extend from 8.30 A.M. to 7 or even 6 P.M. in the slack time, and from 8.30 A.M. to 11 P.M. in the season, work being always terminated at that hour by extinguishing the gas throughout the establishment. At another establishment of a similar kind the hours were stated to be from 9 A.M. to 7 P.M. in the slack time, and from

10. Of Dressmakers and other Needlewomen in London, by Dr. Ord.

7.30 A.M. to 9.10 or rarely 11 P.M. in the season. In another still larger, and in its variety of business far more comprehensive house, the hours in the workroom were stated to be from 8 A.M. to 8 P.M. all the year round. Work is discontinued at 4, 5, or 6 P.M. on Saturday in all these houses.

The statements above quoted are those of employers; but they have been tested by the evidence of persons at present or recently employed in these establishments, and appear to be perfectly trustworthy. They present, I believe, fairly the arrangements existing with regard to hours of work at the larger composite establishments, in which an enormous trade is divided, so to speak, into a number of businesses, some more profitable than others indeed, but all under one system, so as to admit of the distribution of an equal liberality to all departments.

In houses solely of dressmaking.

But in the pure dressmaking or dressmaking and millinery establishments, wherein all profit is derived from this work alone, the hours are, even upon the showing of employers, generally longer.

In one house, conducted evidently with great care, and doing for the most part first-class work, the hours were stated to be from 8 A.M. to 10 P.M.; never more under any circumstances, and sometimes less. These, however, are the regular hours, and, long as they are, are considered moderate. In another house, employing 20 in-door hands, it was stated that the young women breakfasted at 7.30 A.M. and supped at 10 P.M., during the season, doing all the work between; but it was admitted that under pressure these hours were occasionally exceeded. A third employer stated that her work hours were considered to be from 8 A.M. to 10 P.M., with of course intervals for refreshment; that these hours were shortened out of the season when possible, and that in the season they were exceeded. Thus on occasion of one of the drawing rooms of last season they worked from 7 A.M. to 12 P.M.,—17 hours—for three days in succession. At a very fashionable house it was stated, that the hours in the season were from 8 A.M. to 9 P.M., excepting before a drawing room, in which case it was the custom of the house that the workers should get up earlier in the morning instead of going on late at night. They would be required for two or three nights before a drawing room to get up at 5, 4, or even 3 A.M., and thus on 9 or 12 days in the year, they would be working 15, 16, or 17 hours out of the 24. In the winter the hours of this house are from 9 A.M. to 6 or 7 P.M.

From these and similar statements of employers it appears that in the dressmaking houses the hours of work, including meal times, are, in the season 12 or 14, and that they are subject to considerable extension before drawing rooms. But the statements made by girls employed in these houses tend to prove that the work hours in the season, and before drawing rooms, are still longer than is admitted by the employers.

For examples: an employer told me her hours in the season were from 8 to 11, with occasional extension to 12 or 1, but that only the older hands worked the longer hours, apprentices being sent to bed at 11 P.M. An apprentice in this house stated, in the presence of witnesses, that she often worked beyond eleven, and that on one occasion she worked all night, being allowed in compensation to have the whole of the next day to herself; and two workers in this house stated, that, as a rule, in preparing for large drawing rooms they sat up till two or three o'clock on the two or three nights before.

At another house, where the evidence appeared quite trustworthy, the hours in the season were said to be from 7·0 A.M. to 10·30 P.M., including meal times, but the girls alleged that in the drawing room weeks they went on to 11 P.M., 12 P.M., and more. Thus before the May drawing room of last season they remained up till 11 P.M., 12 P.M., 2 A.M., and 3 A.M. respectively, on four successive days, and they estimated that during that time they worked 18 hours a day. They were all quite tired out on the fifth day, and one was reduced to such extreme weakness that she became ill, and did not recover until after a change of air. The above statement was made in presence of the manager of the house, and was not qualified or corrected.

Without multiplying quotations, it may at once be said, that the above allegations agree generally with the evidence given by trustworthy persons, though, as might be expected, there is much exaggeration on both sides.

Summary of facts relating to hours of work.

That the daily work hours during four months of the year are extended at least one, two, or three hours beyond the 10 hours which are now generally considered to constitute the full day's work of male operatives, and that these long hours may at the will of the employers, and under the pressure of short orders, be from time to time further prolonged by two, three, or four hours, may be regarded as certain, according to the evidence both of employers, and of the most trustworthy among the employed.

Food, and times of eating.

The food provided for in-door hands is generally good and in reasonable quantity. Complaints are occasionally, but not often met with, having generally relation more to the cooking than to the food itself. Indeed it is so obviously the interest of employers to keep in good health persons from whom long hours of work are required, that one might reasonably expect to find them well fed. Meat is allowed at dinner, and, when they work late hours, at supper also. If the work be carried far on into the night coffee or tea are allowed, but beer, as tending to produce sleep, is not permitted. The time allowed for meals is generally short, and mostly so when the hours of work are longest. For then every moment becomes valuable, and the girls only leave their work to gulp down their food, and to return.

Exercise.

In a very few houses arrangements are made whereby the girls may get a certain amount of regular exercise, either at the beginning or end of the day. More often an understanding exists, according to which, every evening, one or two girls ask and obtain leave to go out and supply themselves with necessaries; but, generally, no special provision is made for the bodily exercise essential to the health of persons engaged in sedentary employment.

Holidays.

In the slack time at the end of the summer the girls are allowed holidays, varying from a fortnight to a month in duration, when they can go down into the country and see their friends.

I am informed that in some houses the taking of holidays, even if the girls have no friends in the country, is compulsory.

Work-rooms. Their space in relation to their occupants.

The work-rooms occupied by dressmakers exhibit a wide range of difference as regards space, ventilation, lighting, and warming. In calculating their space relatively to the number of persons occupying them, it must be borne in mind that the latter factor is subject to considerable variation, and in the following table, exhibiting the cubic feet allowed to each person, the number of persons usually present in the busiest time is taken as the basis of the calculation.

CUBICAL FEET allowed to each OCCUPANT in 34 WORK-ROOMS.

	100–150	150–200	200–250	250–300	300–400	400–500	Upwards.
Number of Work-rooms	9	4	7	5	5	4	4
Extreme range of number of Occupants	8–35	10–120	7–42	7–70	20–25	8–35	10–16

The above rooms may be considered representative as far as concerns milliners and dressmakers; the accommodation provided in the mantle-making and other trades will be afterwards considered.

For the most part, where the allowance of space is liberal, there also is most care found to be taken for procuring comfort and good ventilation. Excepting in the large composite establishments, the work-rooms are generally nothing more than the larger rooms of ordinary dwellings, provided sometimes with special arrangements for securing ventilation, and always with increased illumination, and, consequently, increased consumption of breathing-air.

Their ventilation.

Excepting in a few instances the ventilation of work-rooms is sufficient to prevent them from becoming close or overheated during the day. In some of the large houses ventilation by special apparatus is carefully attended to; but in the commoner work-rooms ventilation is certainly disregarded, and it is not uncommonly found that ventilators, even when provided, are obstructed either wilfully or of neglect. For instance, in one room, occupied by 25 persons, with 150 cubic feet of space for each, and nine gas-jets burning, I found that four ventilators were provided, two, namely, opening into the chimney, and two in the windows. Three of these were useless, one of the window ventilators having a sheet of paper pasted over it, and the two chimney ventilators being immovable. The air of the room was very close and unwholesome, but I was informed that the girls sitting near the widows could not bear the draught, and had therefore stopped up the ventilator. Sitting for many hours without exercise in warm rooms the girls naturally become extremely sensitive to currents of air, and, in consequence, such obstructions of ventilators are not uncommon. In a low confined room, containing upwards of 30 persons, where ventilating tubes were placed over the gas-burners to carry off the products of combustion, I found three tubes out of four purposely blocked up. Even with good ventilation the work-rooms tend to become very hot and close at night on account of the number of gas-jets required for the proper lighting up of the work. Where the cubical space for each person is 200 or 250 feet, where a large gas light is provided for every three or four persons, and where the ready access of fresh air is not provided for, the atmosphere becomes very unwholesome. Much illness, and deterioration of health among the workers may, in my opinion, be referred to such conditions. The warming of rooms is generally effected by open fireplaces, which of course tend to assist ventilation.

Bedrooms.

The following table exhibits the number of cubical feet allowed to each person in 37 bedrooms inspected, the calculation referring to their most crowded condition;—

CUBICAL FEET allowed to each PERSON in 37 BEDROOMS.

	100–200	200–300	300–400	400–500	500 and upwards.
Number of Bedrooms	1	9	8	11	8

The proper ventilation of bedrooms is even less regarded than that of workrooms. In a few houses special ventilatory apparatus is found, but in a very large proportion of bedrooms the fireplace is the only channel for ventilation, and even this is often purposely closed.

Among the 37 bedrooms above tabulated, four were found provided with special ventilators, and the rest, with only four exceptions, had one or more fireplaces.

As far as I can learn, the bedrooms are rarely overcrowded, and altogether I have seen in the sleeping arrangements of the indoor dressmakers very few circumstances likely to impair the health of the workers. Independently, indeed, of the question of over crowding, the bedrooms provided for dressmakers, resemble in most respects the bedrooms of ordinary dwellings in the metropolis. I cannot, however, refrain from observing that in matters of cleanliness and comfort, many of the bedrooms inspected were sadly deficient.

General summary.

With respect, finally, to the position of the in-door dressmakers, it may be assumed that they live tolerably comfortable, are well fed, and are fairly paid; but that they labour under the disadvantage of working long hours, and of getting very little exercise.

Milliners.

The in-door milliners are subject to a great extent to similar conditions. But they differ, in pure millinery houses, in respect of their hours, which are uniform through the year, averaging 11 or 12, or 15 hours, inclusive of meals. The pure millinery houses are, however, comparatively few, most establishments combining millinery with dressmaking, and when thus associated the milliners are expected to assist the dressmakers after their own hours of work are full. The in-door milliners may, therefore, with the exceptions indicated, be classed with the indoor dressmakers.

Out-door hands or day workers.

The position of the out-door dressmakers and milliners differs in many important respects from the above.

Their hours of work.

Their hours are limited to 12 or 13, namely, from 8 or 9 A.M. to 9 or 10 P.M.; and though frequently exceeded in the season, are still practically controlled by the workers. Generally they are paid at a fixed rate, about 3*d.* an hour, for extra work, and they are to a great extent able to refuse it if they choose.

Miss Newton, the secretary to the Dressmakers Aid Association, informs us that in the case of skilled hands such refusals are not uncommon. For, at present, the demand for skilled hands exceeding the supply, a girl turned off from one establishment readily obtains work at another; so that the out-door hands have a hold on their employers not possessed by the more stationary in-door hands, and have their 12 hours as effectually limited, to use Miss Newton's expression, "as by an Act of Parliament." At the homes for day workers established in different parts of the metropolis, it is generally stipulated that the girls be liberated so as to be in the home by 10 or 10·30 P.M., an arrangement which appears to have indirectly and favourably affected the great mass of out-door workers.

Food of day-workers.

In most houses the only meal supplied to the day workers is their tea. It is about equally rare to find either that this meal is not provided, or that dinner is supplied as well. The amount of wage, comparatively unimportant in the case of the in-door hands, becomes therefore in the case of the day workers a question of the greatest importance. As far as I can learn the general minimum wage for day workers is 9*s.* a week and their tea. In the outskirts and inferior quarters of the metropolis numerous dressmakers are found who work by twos and threes for 1*s.* a day and their tea, and who find even only precarious

employment at this rate; but the hands skilful enough to be employed by the good houses regard 9*s.* a week as their minimum, and rise from this to 10*s.*, 12*s.*, or 14*s.* a week according to their seniority and proficiency.

With these nine shillings they have to find dress, lodging, fire, and food. Girls who live with their parents or friends, casting their earnings into a common stock, and girls who club together can manage fairly upon this wage; but for those who live alone the amount is not sufficient to provide proper food after dress and lodging are paid for. They must pay 2*s.* 6*d.* or 3*s.* a week for lodging, and out of the remaining 6*s.* or 6*s.* 6*d.* find dress and food. According to Miss Newton, the day workers get only one good meal in the day, namely, their supper, at which they try to get meat. But in some houses they are allowed to bring their food and to cook it during the dinner hour. One large establishment provides a cook to prepare the food brought by the day workers who, here at least, earn in no instance less than 9*s.* a week, and generally more. The cook informed me that the food brought by the workers consisted for the most part of chops, sausages, bacon, potatoes in gallipots for boiling, and batter similarly prepared; that many brought animal food only on three or four days, and some even less frequently, subsisting at other times on bread with butter or pickles. The pieces of meat brought to her were often so small as to be hardly worth cooking, and were often of inferior quality and even tainted. The cook noticed also that a certain proportion of the workers did not dine at all. My conclusion, after careful inquiry, is that girls living alone and without other means of support cannot obtain proper nourishment upon 9*s.* a week. Many without doubt find means of increasing their earnings, mostly by taking work home, or by taking in work on their own account, or by less praiseworthy means, but in all cases by encroaching upon their hours of rest. The position of girls going home late at night, say 9, 10, or 11 p.m., to cold garrets, is full of discomfort. If they can afford fuel they light their fire, and cook what is often the only real meal in the day, and after that they have their own needlework to do, so that they have to stay up till 12 or 1 o'clock. But if, as has more than once been described to me, they do not or cannot light a fire, they must go to bed, even in the nights of winter, cold, supperless, and often imperfectly clothed. That under such circumstances many girls should be tempted to habits of dissipation and prostitution is not surprising.

Furthermore a large number of day workers find regular employment only during the season, having at other times to depend either upon chance work or to turn to mantle making or other trades.

Health of dressmakers and milliners.

A combination of several circumstances renders the compilation of statistics relating to the health of dressmakers and milliners an impossibility. In the first place they have no benefit clubs, through which, among most mechanics, tabulated information may be obtained. In the second place the difference between needlewomen and dressmakers is so little understood, and the description given of themselves by female patients so often inaccurate, that the statistics with reference to this class derivable from hospital records are of no value; and in the third place dressmaking is an occupation proper for the most part to only a portion of woman's life, namely, from 15 years to 45 or 50. All statements respecting their health must therefore be of a general character.

The fact that old dressmakers are rarely met with appears at first to indicate great unhealthiness in the class. But the circumstances upon which this fact depends are exceedingly complex. It appears indeed

that dressmakers get old more rapidly than women in domestic service. From many observers I have learnt that women commencing needlework at 15, if they adhere to their employment, are very much aged by the time they reach 30 or 40, being in constitution at least 10 years older than domestic servants. In several highly respectable and fashionable establishments I have found workers of 35 years of age and upwards; but these hands have attained this age in the service of the particular establishments. Otherwise I am informed by Miss Newton and others that dressmakers over 35 years have difficulty in obtaining fresh employment; they are older than their years, their fingers have lost the suppleness of youth, so that they work slowly, and they have no longer, as a rule, good taste in dress. This is, of course, only a general statement, and is subject to many exceptions. Mrs. Chevalier, the manager of a Home in Great Ormond Street, gave me the following information with reference to what becomes of the dressmakers.

"Taking any moderately good worker it is found that she continues "stationary only for a few years. Some rise in their calling, becoming "in succession second and first hands, and at last, having saved money, "go into business on their own account; others marry and leave their "occupation; others, after mastering dressmaking and millinery, take "service as ladies' maids; and lastly too many go down in the scale, "are found not to be good enough for their employment, and degene-"rating into poor needlewomen, drift away eastward."

Causes of early advent of age in dressmakers.

In the case of the in-door dressmakers, the *system* appears to be rapidly worn out by the long continued monotonous work, carried on in close rooms, and for many hours, in an atmosphere deteriorated by gas. In the case of the day workers, the hours, though shorter, appear to be still too long for the limited amount of nourishment accessible. Here again, of course, we find many exceptions in which good constitutions triumph over the most adverse circumstances; but medical observation shows that though dressmakers can work on year after year with only imperceptible ebbing of vitality, and with no evidence of actual disease, yet that they are readily prostrated by slight illness, and that they recover with great difficulty and slowness; their constitution under constant pressure has lost its elasticity.

The illnesses which appear to be most frequent among dressmakers are—

1st. Symptoms of brain distress, referrible to the constant use of the eyes, more particularly by lamplight; these consist chiefly in headache and giddiness.

2nd. Dyspepsia, attributable to the long hours of sedentary employment, the want of compensatory exercise, and the hasty taking of food.

3rd. Diseases associated with depression of vitality, such as phthisis, chlorosis, and hysteria.

4th. Affections of vision, which are comparatively rare among the well fed in-door hands, but are more common among the day workers.

Dr. Tlintoff, the medical officer to the Dressmakers' Aid Association, informs me that in his experience dyspepsia and phthisis are much more common among dressmakers than among domestic servants.

Of diseases therefore specially dependent upon the nature of their occupation we find few among the dressmakers and milliners; we find nothing like the jaw disease of the match-makers, or the mercurial tremors of the looking-glass makers, or the lung disease of the stone

grinders; but we find, in place of such well defined instances of cause and effect, the terrible fact that thousands of women in London are pursuing their occupation under conditions which constantly undermine their vital and physical powers, and contract, with fatal certainty and by large per-centage, their measure of years.

Seeing, therefore that, according to the evidence of persons qualified to form an opinion, dressmakers undergo a slow but well-marked physical deterioration, which appears for the most part to be due to the length of hours of work, the impure atmosphere of work-rooms, and, in the case of many of the day workers, a deficiency of food as compared with the physical effort required of them; and seeing also that their circumstances are in many respects better now than they were 20 years ago, it is important to consider what means may be applied to the further improvement of their condition, so that they may enjoy a standard of health more approaching that of domestic servants.

1st. With regard to the shortening of the hours of work. It has been stated above that, among the pure dressmaking houses, hours of work extending from 8 A.M. to 10 P.M., with at most an hour and a half of respite for meals, are considered moderate. The girls indeed regard such hours, although carried on through three or four continuous months of the year, as reasonable, and the employers who keep within them regard the fact as a matter of pride. Nay, in speaking with reference to the great extension of hours which precedes Her Majesty's drawing rooms, girls have asserted to me that they enjoy the excitement of such nights, unless too often repeated; the furious haste with which the work is pushed on, the speculation as to whether it will be finished in time, and the additional refreshments provided on such occasions have, apparently, some charm for minds wearied with monotonous toil, and in the traditions of some work-rooms these long nights are certainly connected with pleasant recollections. For it is in the power of employers very much to lighten by cheerful kindness, by personal association, and by attention to minor comforts, the weariness of the work-room; and when this is done the remembrance of the fatigue and exhaustion which followed long protraction of work is effaced by the picture of the animated accompaniments which turned dull work into a feverish orgie.

But close questioning elicits from most girls a confession of languor and exhaustion following upon these exertions, and even felt apart from such exertion, as the season advances. Then, as described to me, every evening, at about six or seven o'clock they begin to feel weary, and experience pains in the limbs and back, and headache, or they become torpid and dull; and yet, full of heart sickness, they have still to face three hours at least of further work, and oftentimes more. Many exceptions are doubtless to be found, and may be quoted by persons desirous of maintaining the present state of things, but from careful investigation I believe this description to apply to a very large proportion of the hands.

2d. Causes of the very late hours during the season, more especially before drawing-rooms. The confusion of statements and opinions respecting this point renders difficult the formation of a clear and satisfactory conclusion. One employer will boldly say that the long hours are necessary, that work has to be done, and that the girls don't take any harm from it. Another, throwing the responsibility on to her customers, will say that if the ladies were more considerate, and would only give a few days more of notice, the work might be done with very

little extension of the hours. And then at another house an employer will deny altogether the necessity of the long hours, putting the alleged thoughtlessness of the ladies out of the question, and saddling the defective economy of the work-room with the responsibility.

Considering that in nearly all houses just so many hands are kept as suffice to perform ordinary work in ordinary hours, it is evident that, if large orders are required to be executed in a short space of time, there must be either an increase in the number of hands, or a lengthening of work-hours to meet the new requirements. The margins of profit are not in the pure dressmaking business sufficiently broad to cover the expense of retaining extra hands to meet extra work, so that want of economy cannot in fairness be attributed to employers for that they make no provision of this kind. And there is no floating supply of good workers from which at moments of pressure assistance may be derived. Good workers are indeed rare at all times, and much sought after, so that, as Miss Newton informs me, vacancies in good houses for first-rate hands remain often long unfilled for very want of proper applicants. Applicants there are, and in plenty, but not of the requisite skill; so if at ordinary times good places go a-begging, it is no marvel that when the demand increases there shall be greater difficulty. Moreover, in any house the really valuable hands are those who have been educated in the house, learning all its ways, and growing apt to follow instructions with the readiness of instinct. New hands suddenly taken in must be nearly always derived from the class of day workers, who are certain to require much more supervision, and partly also, from the difference of social position, fail to work heartily and well with the residents.

Very conscientious employers may, and, I believe do, refuse excessive work, but most, yielding to the present interest of the value of the order, and to the more remote interest of the value of the connexion, undertake all or nearly all that offers. And, therefore, supposing that the arrangements in work-rooms are all that they might be, the long hours seem inevitable.

But, as I have before mentioned, the long hours are considered needless by persons well qualified to speak on this subject. Miss Newton, and several employers who having risen from the ranks of workers, have seen the case practically from both aspects, expressed themselves with great confidence. They say that the ordinary hours are capable of considerable curtailment. In the first place by proper arrangement of the work,—the duty of the first hand. This, they say, is done often carelessly and without system, half the hands being left unemployed for an hour at a time while the work is being cut-out for them. Added to this, a certain amount of dawdling, as they term it, is often permitted in the earlier part of the day, if the proprietor's eye is absent, and when the evening comes, the shortcomings of the morning must be repaired. Employers, who themselves discharge the functions of first hands, and who know what may be done by systematic apportionment and vigorous prosecution of work during the earlier hours of the day, are the very persons who keep their own hours short, and who say that others may do likewise. Morning work they say is always the best, and the better the work the shorter the hours. For in the early day the fingers move more rapidly, and with more certainty, the mind receives instructions more clearly, and so little work has to be undone; but work done late at night, by tired fingers under the guidance of dulled and discouraged minds, is always slow and often bad. When girls, not at piece-work, know that however actively they ply their needles, more and more work will be found to fill up the hours fixed

by the will of their employers, they cease to have any object in working fast or too well, and so it comes to pass that what might be done in six hours is extended over eight or nine, and is then not so well finished; but if work were well measured and divided, and the day's allowance meted out with the assurance that no addition should be made, and, the work once done, the workers left mistresses of their time, the result would be, as in certain houses it is, favourable to both parties.

Certain employers, however, defend with great energy the practice of working fixed hours. One employer, who treated his hands with great liberality as regarded food and accommodation, said, without reserve, that his hours of work were from 8 A.M. to 11 P.M.; and that no girl was engaged by him excepting upon the understanding that her time during the 15 hours belonged to him. He asserted also, with what accuracy I am unable to say, that these were nominal hours for the most part, and were generally shortened by two or three hours; but that this was to be regarded as a favour to them, and not as a right. The reason alleged for this practice was, that the girls engaged by him were all of good position, and as far as he could ensure, of good morals; that girls of such a class were, according to his experience, the most valuable as workers; and that by keeping their time under his control he kept them free from bad influences. In other words, although he gave them two or three hours in the evening, he did not allow them to go out at such times, excepting under careful supervision; treating them, in this way, much like girls in a boarding-school. However conservative of morality, such arrangements cannot fail to operate injuriously upon the physical condition of its subjects, by the almost total loss of out-door exercise, and by the deadening constraint placed upon their liberty.

Lastly, in the question of how hours may be shortened, it is important to remember that the methods above discussed, can only take effect where the hands are well skilled. Bad work will inevitably produce long hours. The difficulty of obtaining skilled hands has been before noticed; and persons of long experience assert that the difficulty increases. They attribute the falling off to various causes, but particularly to the fact that the persons now entering houses of business come from a lower class than formerly—say, for instance, 20 years ago. Then, persons of fair social standing, tradesmen, country farmers, and poor professional men, used to apprentice their daughters to good London houses, where they were certain to be well fed, and where their morals would be cared-for, without great loss of position. Of late, these sources of supply have greatly failed, owing probably to notions, true or false, with reference to the morality of dressmakers. Persons derived from an inferior class, paying no premium, and seeking the work as itself an advancement, not as a means to advancement, receive less careful instruction, and having less interest in doing well, turn out less carefully executed work. On this point I am quoting employers, and the statement may require qualification, but it is one which is often made, and which probably contains a large proportion of truth.

The conclusion to be drawn from the careful examination of the subject, appears to be that without external interference the hours of work may be very generally shortened by improvement of internal arrangements. The question is one of great social importance affecting the customers, the employers, and the employed, and may go far toward solution if the three classes work in harmony; the customers

with leniency and discrimination the employers with moderation, with careful regulation of the economy of the workrooms, and with use of encouragement to those who will work actively, and the workers by diligence and attention to their tasks. It is satisfactory to observe that the recognition of these points is making progress, and much may be expected from the influence of such institutions as the Dressmakers' Aid Association, the Ladies Sanitary Association, and the many homes which are now provided by the benevolent.

The scarcity of skilled hands suggests that workers have it in their power by combination to fix their own hours of work, but their isolated position and close confinement in houses of business appears on the other hand a bar to associated action; and, at the present time, when the operation of trades' unions are doubtfully regarded by the public, the formation of similar associations among women cannot with propriety be recommended.

The second great point in connexion with the health of dressmakers and milliners, namely, the condition of work-rooms and bed-rooms appears likely to be much affected by the mere fact of publicity, whereby the existence of prejudicial circumstances and the need of their removal shall be made known. The report made by Mr. Grainger appears to have had in many respects a most beneficial effect, and much may now be hoped from the attention which has of late been again directed to the subject.

With regard to any direct interference on the part of the legislature, it must be observed that the great extent of the variations in houses of business, as to size, kind of work, and position, render logical definitions, upon which alone efficient legislation can be founded, a matter of the greatest possible difficulty. To place under one law the dressmaker who, with one assistant, works in a garret to earn 20*s.* a week, and the court milliner who employs 30, 40, or 50 highly paid women upon expensive work, would have the effect of injuring either the one or the other. If it were possible to register and keep under control houses in which 5, or 10, or more workers were employed, much good might be effected, but a far larger evil would be left untouched. For in the poorer houses long hours are rendered necessary to make even the common work remunerative; and, as affecting these, the question changes to one of political economy, involving the relations of demand and supply.

Condition of needlewomen other than dressmakers and milliners.

But the milliners and dressmakers constitute only a small proportion of the women earning their living by the use of the needle. In all parts of London are to be found establishments for the wholesale manufacture of various articles of apparel,—mantles, bonnets, head-dresses, cap-fronts, collars, coats, shirts,—the multitudinous articles included under the head of slops, &c. Some of these manufactures—shirt-collars, for example—are of sufficient importance, and in sufficiently persistent demand, to furnish constant employment to houses maintaining large numbers of hands; others, such as mantles, are made in large quantities at particular seasons, leaving a comparatively slack intervening time, during which other work, such, for instance, as waistcoat-making, is taken, in order that a certain number of hands may remain employed, while the rest are temporarily discharged. In such wholesale establishments the regular hours of work are rarely, if indeed ever, more than 12, inclusive of meal times; and in many houses where sewing machines are used they are only 10½ or 11. Work for the most part begins at 8 or 9 a.m., and lasts till 8 or 9 p.m., with an interval of one hour

Arrangements of hours, &c. in wholesale houses.

for dinner and half an hour for tea. The practice of working extra hours is of course more frequent in the trades which are subject to seasonal pressure, such as the mantle makers; but all extra work is especially remunerated, at the ordinary rate if it be piece work, or at twopence or threepence an hour if the payment be for time. But in the badly paid trades, such as shirt-making and collar-hole sewing, where the payment, whether by piece or time, is very small, the practice of taking work home is common, and there is in such cases no limit to the period of work.

As a rule, I have no reason to believe that the hours are in these trades excessive, as far as concerns the factories; and with reference to work carried on at home after regular hours, no estimate can be made.

The workrooms exhibit in the different trades very wide differences. But with reference to the conditions under which women work in these houses, a short description of two or three typical houses, each devoted to a particular trade, will give a better idea of their arrangements than any more general statement.

Examples. Work-rooms, &c. in collar-making trade.

1. A factory in which about 400 persons are employed in collar-making. In this trade economy is promoted by division of labour, and under one roof are found hands employed respectively in cutting out the work, in fixing work, in sewing collars by machine, in sewing button-holes by hand, in starching and ironing collars, and in arranging them for sale.

In this house the women at work were of all ages, but principally between 20 and 30 years of age. Among them were some young children, only nine years old, who were acting as messengers. On inquiry being made with reference to the employment of such young persons, it was stated that they worked the same hours as the rest, but only as messengers, the intelligence requisite for the efficient working of the machines not being developed before 12 or 14 years of age. The hours of work in this house were from 9 a.m. to 7 p.m.

1st Room.—Collar-making by machine and hand. Cubical area, 27,300 feet. Persons present, 95; full number, 120. Cubical area per head, at present, 287 cubic feet. Cubical area per head, at full time, 229 cubic feet. Forty machines (Thomas's) at work. Ventilation by windows, and by traps, which work easily. Warming by hot water and by gas. Air of room at present close and somewhat fetid.

With reference to the physical condition of the women, no questions were permitted to be put.

The machine workers were all young,—from about 15 to 25 years, and looked well nourished and in fair health. They worked by the piece, and their week-books, which I was permitted to inspect, showed that they earned from 12*s.* to 21*s.* a week, 14*s.* to 16*s.* being the average. The handworkers, employed in tacking the work together for the machinists, and in sewing button-holes, included women of all ages, from 9 to 50. Their appearance was in all respects inferior to that of the machinists; they were worse clad, paler, and worse nourished. Their earnings were said to average 9*s.* a week.

2nd Room.—Laundry. Cubical capacity, 27,000 feet. Present, 30 women, variously employed in washing, starching, ironing, and packing collars. Cubic capacity for each 900 cubic feet. Temperature 79° Fahrenheit, external temperature, 72°. Ventilation by doors and windows. Windows only on one side of the room.

3rd Room.—Sewing machines. Area, 18,144 cubic feet. Present, 50 women. 363 cubic feet to each. Windows at both sides, large, and opening freely. Air fresh and sweet.

4th Room.—Needlework. Area, 15,000 cubic feet. Present, 42 women; full number, 60. Appearance of women, healthy. The Superindtenent states that they are seldom absent from work. Ventilation by windows and open fire-place. Air fresh and sweet.

At another similar but somewhat less extensive establishment, in which the space provided for each worker was somewhat larger than in the preceding house, questioning of the workers was permitted.

Twenty-two women employed at sewing machines were examined. They were all young, ranging from 18 to 26 years of age, but most of them between 19 and 23. None were examined who had worked less than six months at the machines, and some had been as long as six years. Their hours of work were from 8 a.m. to 8 p.m.; their earnings were stated by themselves at 10*s.* to 22*s.* a week, the average being 14*s.* or 15*s.* Nearly all resided at a distance of three or four miles from the factory. Their appearance was noted as healthy in 17 instances, delicate in three instances, unhealthy in two instances. The account they gave of their health was that it was generally good, their chief complaint being of pain in the chest, occurring at the end of the day's work; but this, according to the statements of the older hands, was less felt after the first year. They knew of no instances in which girls had been obliged to give up the work on account of any injurious effects produced by it, and those who had before worked with the needle alleged that their health was now better.

In the button-hole room were 24 women earning 7*s.* 6*d.* to 12*s.* a week. These worked by time, and received a weekly wage of 5*s.* or 7*s.* for the 12 hours from 8 a.m. to 8 p.m. By taking home piecework, they were able to raise their earnings to the above quoted amount, but at the expense of several hours taken from their night's rest. These women were of all ages, several of them being as old as 50. They appeared moderately healthy, and when questioned made no complaint of ill-health. But they looked weary and older than their alleged ages. In another room 40 women were employed at tacking, &c., their hours being 9 a.m. to 8 p.m., for which they received 5*s.* to 7*s.* a week. This wage was systematically raised to 7*s.* or 10*s.* by home work, carried on till 11 or 12 p.m. As regarded health they were in much the same condition as the button-hole makers. In the ironing room, where girls under 20 years of age were employed, constantly standing, in a temperature of 78° Faht., the pernicious influence of the occupation was very apparent. The girls complained of weakness and languor, were all sallow and feeble-looking, and expressed most decidedly their opinion that their health had suffered considerably since they had commenced the work. Girls of 14, 15, or 16 years of age were here working under an association of conditions most injurious to adolescent frames; conditions of high temperature, moist atmosphere, and exhausting posture.

The proprietor of the establishment informed me that the health of the women was generally good, the average number absent from work being about one daily. He admitted that the hand-workers could get only imperfect nutrition, upon the low rate of wages, and said that they did not get meat more than occasionally, replacing it by some highly flavoured substance which would enable them to swallow the

staple article of their food, dry bread. The dinners of the girls, which he had noted with some care, would consist often of a pennyworth of pickles and a pennyworth of bread.

2. Mantle-making.—The houses engaged in this trade are of two kinds. They are either large wholesale establishments, or they are smaller middle-houses, in which material supplied by larger houses is made into mantles or similar articles of clothing.

In the mantle-making trade.

(*a*) A wholesale mantle-making house.

1st room. Cubical contents, 12,000 feet. Persons present, 50; full number, 100; area allotted to each individual in cubical feet, 240—120. Ventilation and lighting effected by roof-lights. The room was visited in summer, when the air was pure, and the temperature comfortable; but in winter the temperature is raised by closing the window and lighting the gas, there being no special warming apparatus. It was stated that under such circumstances the air became much heated and impure.

2nd room. Area, in cubical feet, 19,800. Persons present, 13 (slack time); full number, 100. Ventilation by large moveable side windows, good. The work-hours in this house were from 9 a.m. to 7.30 p.m., with intervals between 1 and 2 p.m. and 4 and 4 30 p.m. A separate room was provided for their meal taking, and hot water was here supplied to them. In this house the cutting-out work was done by men; the sewing by sewing-machines, worked by young women and girls, and the hand sewing of button-holes, the fixing of buttons, with other details, in which the sewing-machines could not be used, was done by women of all ages. I was here informed that girls under 13 years of age were not competent to use sewing machines, but I found among the hand-sewers several evidently of fewer years.

The earnings (payment here was altogether for piece work) of the machinists were stated at about 15*s.* a week, the earnings of the hand-sewers from 10*s.* to 25*s.* a week, but comparing the statement with others it is probably above the mark.

Not being permitted to put questions to the women, I could judge of their health only from their appearance, and from what their employer chose to tell me. They looked moderately healthy and well nourished, and were said to be seldom ill or absent from work; but it was stated that they suffered from the condition of the rooms in the winter—a condition which the employer expressed his intention of improving.

(*b*) From the middle-houses I have selected two, which illustrate very well the degrees in which the condition of workers may be influenced by the liberality or prosperity of employers.

1st house.—The work carried on in a single room; area, in cubical feet, 4,800; full number of persons, 24; area to individual, 200 cubical feet; room well-lighted and ventilated, warmed by an open fireplace; numerous ventilators in good working order.

The women here, all skilled hands, stated that they earned 11*s.* or 12*s.* a week with the needle, and from 15*s.* to 20*s.* with the machine. The hours were from 8 a.m. to 8 p.m. The women looked and stated themselves to be healthy.

2nd house.—One room, area in cubical feet, 1,280; persons present, 14; area to each, in cubical feet, 91·5.

The women here were weary-looking and squalid; their earnings were stated to be 7*s.* to 15*s.* a week, and their tea. The hand who earned only 7*s.* was young and inexperienced. Hours 8 a.m. to 8 p.m.

The small room into which these 14 persons were crowded was ill ventilated. There were two moveable windows and a fireplace, but the latter was blocked up, and there was no special ventilation of any kind. This house, in which comfort and health were alike ignored, displayed most painfully the evils to which the servants of poor employers are subject.

In the slop trade.

3. Slop-making.—This, again, is a trade in which many grades are to be found.

First stand the large houses with plenty of capital, who make up many goods on their own premises, but send out a far greater amount of raw material to middlemen, by whom it is returned to them made up. Then come the middle-men, who sometimes get all the work done on their own premises, but often parcel it out among a second class of middle-men. Under this system the wage which the first employer can, consistently with fair profits, pay to the worker, pays mostly one, often two, and perhaps more tolls, and becomes thereby pitifully reduced. Two examples may here again be exhibited.

(*a.*) A large wholesale clothing establishment.

1st room. Area, in cubical feet, 46,000. Persons present, 50; full number, 70. Area to each, in cubical feet, 650 to 900. Room large, but gloomy; lighted by windows on both sides. No special ventilating or heating apparatus. The persons employed here were of both sexes. Women, constituting rather less than half, were doing the heavy work of tailoring with Thomas's sewing-machines and the needle. The men were employed in completing the clothes. The workers of both sexes were clustered along the sides of the room, and in the corners where they could get light, leaving a large space in the centre quite unoccupied. Hours 8 a.m. to 8 p.m. Piece work. Good time for meals, which could be cooked on the premises. A second room, containing 60 persons, exhibited similar conditions.

The women here were far from healthy, but gave no account of their being subject to any special illness. The evidence given by some of them, particularly with reference to machine work, was most interesting, and may be quoted here with advantage.

A. Age 18. Has worked four years at the sewing-machine. Hours 8 a.m. to 8 p.m. Earnings 14*s.* to 19*s.* weekly. Appearance healthy and vigorous. Before she worked with the machine she was two years at home upon hand-work. Considers that her health has since then improved.

B. Age 19. Has worked $3\frac{1}{2}$ years at the sewing-machine, and before that with the needle. Average earnings 18*s.* a week. Appearance pale, but not wasted. Says that her health is good, and that she is not over-tired at the end of the day.

C. Age 22 years. Has worked five years at the sewing-machine. Earnings 16*s.* a week. A woman of slight frame, and pale. Says that her health is not good. She has no special complaint, no hæmoptysis, no indigestion, no headaches; but she feels that her strength is not sufficient for continued work. She felt much the same when she worked with the needle, before taking to the machine.

D. Age 24. At hand-sewing four years. Married. Works here with her husband. Has four children. Suffers from indigestion, and has had hæmoptysis. Father died of consumption.

E. Age 26. Married. Four children. Earnings 16*s.* to 20*s.* weekly. Appearance older by 10 years than the age stated. Has

worked seven years at the machine, and does not find it disagree with her. She has been recently confined. She worked on to within six weeks of the event, and resumed work six weeks after it. She nurses her child.

F. Age 21. Two years at the sewing-machine; before that at hand-sewing. Her health is good, quite as good as when she was at hand-work.

G. Age 22. At sewing-machine 3½ years. Earnings about 18*s.* weekly. Health good in every respect. Appearance healthy.

The earnings of the machinists were stated at from 14*s.* upwards; the hand-workers earned less.

2nd. "A middle-house in which materials supplied ready cut out are made up into clothes. An old cramped house in the east end of London.

"1st room. At the back of the house, small, low-roofed, and dirty, with a long low window, out of which (in summer) an entire sash has been taken. With this arrangement the ventilation is now good, but there is no fireplace or other aperture for ventilation; and in winter, when the window is closed, with the gas burning, the room must become very close. Area, in cubical feet, 2,390. Present eight persons. Area to each, 297 cubical feet. Three women working with machines; the rest with the needle. Ages 15 and upwards.

"2nd room. A garret, with small windows and an open fireplace, but no special ventilation. Area in cubical feet, 2,025. Present, nine persons. Area to each, 225 cubical feet. The room is rickety and dirty.

"3rd room. An old stable loft, built in part of wood. The windows are make-shifts; some broken and some fixed. Altogether there is plenty of ventilation, but of a kind which is far from pleasant and not under control.

"All work is here done by the piece, and workers who cannot earn 10*s.* a week are considered useless, and are consequently discharged. The hours are 10 daily."

The women here were mostly pallid, but were anxious to repel any imputation of their health being bad. One of the needle hands had worked 33 years, and still enjoyed good health.

The foregoing instances will serve to convey some idea of the different circumstances affecting the health of women employed in the various branches of vestiary manufacture which are carried on in large establishments. They demonstrate, in my opinion, the existence of an urgent necessity for a reform in the arrangements of workrooms, while they show that in such establishments it is in the power of good workers to earn fair wages. On the other hand, it must be observed that the wages, as quoted, are given from the information of employers, or of hands speaking in the presence of employers; and without imputing falsehood to employers, it is not unnatural to assume that they tend rather to state the best of their case.

The trades quoted are of course but a small portion of the class under consideration. But I believe that they may be considered as representative in most respects of the grades into which the class is divided.

Poor needlewomen.

But, beyond and far worse off than the associated workers, are the poor needle-women, who work singly or in small groups, parcelling out among themselves the making of garments, two at a shirt, three at a coat, and so forth. In this class, numbering thousands, and probably

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tens of thousands, the variety of conditions to be considered is much reduced. The question is purely one of sustenance; their workrooms are their own garrets; their work hours are regulated by their necessities; and the point left for our consideration is the proportion of their earnings to the standard at which it becomes possible to buy food enough to nourish the body.

It is certain that there are thousands of women whose earnings fall far short of such a standard. In all parts of London are to be found women working with the needle as a last resource; women who have fallen in circumstances; women whose health has failed, and left them unfit for domestic service; widows with one or more children at home to support; women too old to be of use to any employer; such—with women who from natural dullness, want of proper education, or other causes cannot work well enough to be of use as day workers—are the feeders of this class.

A domestic servant becomes consumptive or epileptic, or paralytic; is maimed by an accident, or in some way unfitted for service. The needle in such a case seems to be regarded as her one natural resource, and, skilled or unskilled, she flies to this most precarious means of support. And so on through the many circumstances under which women may be suddenly called upon to support themselves or others. They betake themselves to an occupation which seems to be easily acquired, in which some little employment can be always assured, and which is especially suited to the female sex. It follows that in the commoner and most abundantly required kinds of needlework, the market, already well stocked with hereditary, and, so to speak, natural operatives, is flooded by a crowd of the out-pourings from higher classes, flooded, in fact, with incapables, all eager for employment, and starving as they are, clutching with avidity the scantiest remuneration for the work of their tardy ill-taught fingers.

I will here quote one or two of the stories told me by women met with at hospitals.

M. B., patient in Brompton Hospital for Diseases of the Chest; age, 24 years. Has worked at the needle two years, having previously been in service, which she left on account of failing health. Works in a private house with one other person, who gives her 1*s.* a day and her tea. She lives in lodgings, for which she pays 2*s.* a week. She admits that she cannot live upon the residue, but states that *she has one or two friends* who supply her with necessaries.

E. R.; age 26. Plain needlewoman. Used to work at the Hinde Street Institution under Miss Barlee. Takes in the soldiers' plain shirts. Working with her mother, she can do from three to eight shirts a week, getting 6*d.* for each, and finding her own thread. She and her mother pay 2*s.* a week for lodging, and live on the remaining 2*s.* Half-a-crown is also allowed to the daughter from the workhouse. She works generally from 11 a.m. to 7 p.m., being employed in looking after domestic arrangements. Is able to get meat sometimes once a week; often not even that. Health not good enough for service.

2. (Westminster Hospital.) A plain needlewoman, age 30. Eight years at the needle. Goes to a house to work at shirt-making, receiving 2*s.* a shirt if of long cloth, 2*s.* 6*d.* if of linen. But the making of a shirt is usually divided. She would make one part, and her fellow worker another. Her share would be 1*s.* 1*d.*, and by working very hard she might get through two shirts in one day, but more generally three in two days, so that her earnings are 8*s.* or 9*s.* a week. She

works from 6 a.m. to 9 or 10 p.m., finding her own needles and thread. Wages paid regularly.

To recapitulate, in the various branches of vestiary manufacture considered in this 2nd division of my report—

1stly. The work-rooms exhibit great variety of condition, some being decidedly calculated to impair the health of their inmates, and others showing that good and effectual attention has been used in making them comfortable and healthful.

2ndly. The regular hours of work are, as far as regards houses of business, moderate, but subject to considerable extension in certain houses at certain times, by the practice of working extra hours for extra pay, and in other houses by the practice of taking work away from houses of business, to be done after hours at home; both practices being, it may be added, often compulsory.

3rdly. The earnings of the women vary between 5*s.* or 6*s.* a week, and 20*s.*—30*s.* a week, according to the skill of the workers, and the nature of the work.

4thly. The difference in the condition of persons working in the wholesale houses of the City and West End, and of persons working in their suburban feeders and subordinate houses is worthy of attentive consideration, particularly when the question of remedial measures is raised.

With reference to the health of this class of women, no well-defined conclusions can be drawn. They may be seen grouped in the workshops, and their general appearance may be noted; but personal questioning of women of this class, in presence of a giggling crowd of listeners, leads often to no satisfactory results, and even this proceeding is frequently interdicted by employers, on the ground that the women are unsettled by it.

In the records of hospitals and dispensaries, again, the employments of women are necessarily so slightly defined that no use can be made of statistics derivable from such sources. But all the information that I have been able to collect tends to show that what has been said with reference to dressmakers applies also to the classes under consideration, making due allowance for the general social inferiority of the class, and the consequent less average regard of cleanliness, &c.

In the larger houses of the classes now described, the influence of the sewing-machine upon the health of women using it has been investigated. This implement has been in use only for the last nine or ten years, but I have met with few women who have worked so long at it. The sewing-machine is for the most part worked by young women, who appear more ready than their seniors in acquiring the skill and tact necessary to the proper and profitable use of the machine. In the City, East End, and wherever the work is constant and regular, I have found that the influence of the sewing-machine is for the most part beneficial to the workers. In the first place, and this is probably the essential point, they earn far more than the needle-workers. Even where the payment is for time the machinists are paid half as much again as the needle-workers, and at piece work the difference is still greater. In the second place, the muscles of the limbs and trunk are kept in exercise—a circumstance which, associated with the power of getting good food, appears to tend to improve the health of the machinist. On the other hand, the cramped position rendered necessary is alleged to cause pain in the chest and indigestion; and the continual noise made by the machines is said in some cases to cause headache and giddiness. But touching the important fact, that, comparing in a given room the

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machinists and the needlewomen, the comparison as regards healthiness of appearance is greatly in favour of the machinists, there can be no doubt.

In the West End, where the machine is less common, and even where used less continuously worked, its influence is regarded less favourably. Delicate girls, unused to hard living or muscular toil, seem to be greatly exhausted by the use of the machine, just as a clerk would be by digging, and never having a sufficiently prolonged continuance of the effort never become accustomed to it. So the machine is in disrepute. I have seen girls of this class, who, according to the evidence of observers, had aged with great rapidity, at the rate of five or six years in three, at such work.

If there were any thought of legislating for the improvement of the condition of this class, the chief points for consideration would be the state of work-rooms, the length of hours, and the age of workers.

Persons well versed in the operation of Factory Acts in the provinces might be able to suggest means of registering, inspecting, and regulating, not only the factories of the mantle-makers, collar-makers, and slop-makers, but the work-rooms and work-hours of the milliners and dressmakers, and the smaller subordinate houses in which, as before stated, so much improvement is required. And there is no doubt but that such means, if capable of efficient application, would do much to improve the health of the needlewomen of all classes. But the great question of wage cannot be reached by such means. This has been recognized by benevolent and energetic persons, who have devoted themselves to the improvement of the condition of the poor needlewomen. The Hinde Street Institution, under the management of Miss Barlee, proves how much may be done, on the one hand, by the elimination of middlemen, and by direct treaty with the large wholesale houses and the government, and on the other, by the proper education of the women in their apparently simple trade. This question, however, belonging to political economy, does not appear to me to come within the scope of this Report, and will therefore receive no further consideration.

In conclusion, I beg to observe, that the foregoing sketch of the condition of needlewomen of all denominations is traced carefully within the outline of facts, in so far especially as it represents the relations existing between employers and employed. Extreme cases of hardship and oppression might have been stated, with the effect of adding much vigour and pungency to the picture; but, though such cases are indeed known, they would have been out of place in such a general statement as that in which this Report consists. The fact of their existence renders only a little more urgent the improvement which the calmer foregoing statement indicates as undoubtedly required. And in framing a Report on a subject regarding which both statements and opinions differ among themselves well nigh diametrically, it appears to me that even the suspicion of exaggeration, whether in particular assertions or in the impression conveyed by the total statement, is to be avoided. The case as here portrayed is a sufficiently hard case, and the remedies applicable to the ordinary class of conditions will, in my opinion, obviate the extraordinary.

No. 11.—REPORT by Dr. EDWARD SMITH on the SANITARY CIRCUMSTANCES of PRINTERS in LONDON.

In prosecuting inquiries into the sanitary condition of printers, I have visited the principal as well as some of the smaller printing offices in London, and have also included the various divisions of the trade, as the newspaper, book and jobbing offices; and wherever night-work was a marked feature in the establishment I have made my examination during the night as well as during the day. In all cases alike I have freely obtained general information from the master printers, or their managers and overseers; and whilst visiting every part of each office have conversed with the journeymen and apprentices, with a view to ascertain their state of health, and their views as to the sanitary nature of their occupation. It is also necessary to add, that I have not restricted myself to those establishments which are known to be very defective in their sanitary arrangements, but have chosen the best and the worst, as well as those of ordinary excellence.

Objects of Inquiry.

In conducting the inquiry, I have given especial attention to the following circumstances:—

1. The condition of apprentices, and the terms of apprenticeship.
2. The mode of pursuing the occupation of a printer.
3. The periods and duration of labour, and particularly night-work alone or conjoined with day-work.
4. The sanitary conditions of the place of labour, and particularly the means adopted to maintain ventilation.
5. The income, with a view to determine the sufficiency of the means of living, and the necessity for extra work.
6. The kind of food obtained, and the arrangement of the meals, and particularly with night-work and prolonged periods of labour.
7. The general habits.
8. The evidence of health as offered by the aspect and personal experience.
9. The amount of sickness as proved by the records of the sick societies in each office.
10. The mortality and cause of death.

On many of these subjects there was some uniformity in both letter-press and lithographic printers; but, as in others, there was some diversity, it will be convenient to consider the two classes of operatives separately.

1. LETTER-PRESS PRINTERS.

LETTER-PRESS PRINTERS.

Division of Offices.

The offices are divided into two classes, union houses and shut-up houses; the former employing in one or all of the departments only the members of the trade union, and accepting all the conditions which the union enforces; and the other employing such persons as the master

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printers may select, and making their own rules and regulations. The former are by far the more numerous. There is a division of the trade into newspaper and book offices, which is of greater importance in the inquiry, since, as a rule, there is more night-work in the former than in the latter. It is further necessary to bear in mind, that offices differ much in the class of trade or kind of printing which they cultivate, and which is more or less remunerative to the operatives, and attaches them more or less permanently to one office. As a general rule, the older houses, with a fixed character of trade, retain their operatives for very lengthened periods, and the condition of the operatives is enviable, whilst in other houses, where the amount of work varies much from day to day, and where a much larger number of operatives are required at one period of the year than at another, the population is more fluctuating, and the character of it less desirable. Hence, the conditions of the trade are very varied; and in order to obtain an acquaintance with the sanitary state of the operatives, it is necessary to pursue the inquiry into many establishments.

Character of the trade.

Classes of printers.

Printers are divided into five classes, all of which are found in the large general printing offices, but only two of which may exist in small offices, or in special ones, as newspaper offices, viz.—

Readers, who represent the mental culture of the office:

Compositors, who are remarkable for quickness and nervous excitability:

Pressmen, Machinemen — who represent the mechanical ability of the office:

Warehousemen — who are essentially porters:

besides numerous boys, who help the reader (reading boys) and the machine minder (machine boys), and warehouse and errand boys.

Apprentices.

Apprentices; Selection of.

Apprenticeship is restricted to compositors, pressmen, and machinemen, and endures for seven years, from whatever age it may commence, unless, for very good or very bad conduct, the master frees the boy at an earlier period from his indentures. They are usually selected from the reading boys for compositors or pressmen, if after trial they show the required aptitude, and from machine boys for machine men, those intended for compositors being the most intelligent and the best educated; and a general opinion is formed as to the possession of a sufficient degree of health. Hence, as a rule, the various classes of printers enter the office at about 12 years of age, and become gradually accustomed to the sanitary condition of, before they are permanently attached to the trade. They are divided into in-door and out-door apprentices, although in both cases the master is by the terms of the indenture bound to provide them with board and lodging, and to watch over their conduct; but in the latter case he delegates these duties to the parents or guardians, who enter into a bond with him for that purpose. In only one office, and that a most respectable one, have I found in-door apprentices, and in these the apprentices live with the overseers, parents, or other responsible persons belonging to the office, and proper supervision is exercised over their food, health, and moral conduct. In this case only pocket-money amounting to 5*l.* or 6*l.* a year is paid to the boys, and a certain sum for their board and lodging is given to those who have charge of them. The out-door apprentices

Age at entering the office.

Terms of apprenticeship.

Income.

are paid weekly sums, varying from 4*s.* to 10*s.* 6*d.* per week during the first year to 20*s.* per week and upwards at the end of the apprenticeship. In some offices there is a fixed money payment, beginning after the first three months, and increasing with each year; whilst in others the fixed payment is limited to the first, second, and perhaps the third year, and afterwards a proportion of one third to three fourths of his earnings is paid to the apprentice. In all cases the master printer is bound to a minimum money payment weekly; but if the apprentice be idle or careless, or if, on the other hand, he be a good workman, and well conducted, the master pays him in proportion to his earnings. Usually the latter arrangement rests purely with the employer; but in some offices the boy is allowed to adopt that plan as early in his apprenticeship as he may desire. The precise arrangements of each office have been carefully collected; but as a general expression it may be affirmed that the weekly wages in the first and second years of apprenticeship are quite insufficient to maintain the boy, whilst in the latter half of his term his income is abundant, and in many instances large, in relation to his age. Hence, the young boy must be assisted by others to obtain the necessary board and lodging, or experience the evils of insufficiency; whilst at at a later period the apprentice has means wherewith he may pursue either good or evil courses. There is no supervision of out-door apprentices by the master, except that of an indirect nature, which he may exert, by refusing to accept an apprentice who has not respectable guardians; and hence it cannot be doubted that the youth and young man are left to adopt any plan of life which may seem good to themselves.

Supervision of the masters.

The food which is supplied to in-door apprentices is good and abundant, and on careful inquiry I have not found any deficiency among the out-door apprentices. The usual plan is to take a breakfast of tea or coffee with bread and butter at from 7 to 8 a.m.; a small lunch of bread and butter at 11 o'clock. Dinner of hot meat with vegetables and bread, or if cold meat with bread only, at one o'clock. Tea, with tea and bread and butter, at five o'clock, and supper of meat and bread or bread and cheese at nine to ten o'clock. Breakfast and supper are taken at home, but usually dinner and tea are taken at the office or at the cook-shop, the former consisting of hot meat when it is bought at the cook-shop or cooked at the office, and of cold meat when it is brought from home. It is unusual for out-door apprentices to have pudding, except on Sundays, and some have fresh vegetables on Sundays only. The quantity of meat eaten at the dinner varies from 3 oz. to 5 oz. when cooked, or it is ½ lb. uncooked, when a chop or steak is bought, and cooked at the office or at the public house. Beer is usually taken at least twice a day, but this varies much with the age of the boy.

Dietary.

The usual hours of labour are from 8 to 8½ a.m. to 8 p.m., except on Saturdays, when work ceases at 2 p.m. In many offices there is an express desire to avoid tasking the apprentices with over work. In others, however, the apprentices take their share of over work with the journeyman; and whenever employed beyond 8 p.m., whether working by the piece or at fixed wages (technically termed being "on the establishment"), extra payment is made, which reconciles the apprentice to the infliction. The morning newspapers generally do not take apprentices, since they deem them unfit for night work; but in some book offices the apprentices may be required to work throughout the night as well as on the preceding day, if the work which they have in hand be urgent, or if there be not a sufficient number of journeymen to do

Hours of labour.

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the required work. Moreover, when the apprentice arrives at his last year of apprenticeship, he is generally equal to a journeyman, both in capability for work and power of endurance. When he is required to work throughout the night, a variation in the arrangement of the meals occurs.

Aspect.

I have carefully examined the aspect of the apprentices at the different establishments, and inquired into the mortality which has occurred during their apprenticeship. Usually they are pale and thin, with sunken features and large pupils, but in other cases they are fleshy, and have colour, and do not show a low type of health. Very generally they affirm that they are well, take their food heartily, and digest it well, and have not degenerated in health. In some offices they are admitted as members of the sick society which exists in the office, but this is not the usual practice, and when it does occur the cases are mixed with those of journeymen, and do not permit me to determine the amount of sickness which the apprentices alone have experienced. Hence when sickness occurs the friends must support them, but usually the master aids them for a period, and in one office a sum of 6*d.* per week for three years, and 1*s.* a week for four years, is deducted from their earnings, and constitutes a fund from which they may draw (if such should be necessary) in periods of sickness, and which is their own at the end of the apprenticeship. It has been stated that country boys sooner lose flesh and colour than town boys, and are among the earliest to fall into serious disease.

Members of sick societies.

Mortality.

As the number of apprentices is not large in any office, and the overseer or manager has known all of them for many years past, I have usually been able to ascertain the number of deaths which have occurred, as also the cases in which long-continued sickness was suffered; and the following are some of such instances:—

Mortality among Apprentices.

No. of Office.	No. of Apprentices.	No. died during their Apprentice-ships.	Cause of Death.	No. of years included.
1	47	2	2 died after the term expired.	7
2	118	9 1 a suicide.	8 of consumption	10
15	15	2	Consumption	—
18	40	3	2 of consumption 1 of brain disease	10
19	10	None	—	—
23	14	None	—	—
25	6	None	—	6
29	18	None	—	10
30	10	None	—	6
31	12	None	—	6
32	30	6	—	10
34	10	1	Consumption.	10
35	20	—	2 were very ill when they left.	10
36	25	None	—	10

Hence, of 375 apprentices, only 1 in 162 died during the term of apprenticeship, a rate of mortality somewhat less than one per cent. per year.

Adults, &c.

Adults, &c. Domestic arrangements of the trade.

The term journeyman is the trade designation of all the operatives who have finished the period of apprenticeship, but does not apply to those branches, as that of readers, in which there was not an apprenticeship. The meeting of the journeyman together for any common trade purpose is termed "a chapel," and one person is selected to be the head, and is called "the father of the chapel." A variable number of journeymen compositors in nearly all offices are associated together into a band called "a companionship," all of whom perform their work together, whilst there is a head man, termed the "clicker," who distributes the work amongst them, and makes it up into pages, &c., and is the medium of communication between the journeyman and the master. This is important in a sanitary point of view, in reference to overwork, since, instead of one or a few being employed for a lengthened period into the night, the whole companionship, or any large part of the companionship, share it, and the period is less prolonged. Beyond this arrangement, there is commonly an overseer over each department and over the whole establishment, and they act more directly in the interest of the employer.

Readers.

Readers; qualification of.

Many readers are extensively read and well educated, either in general literature or in classical, mathematical, or other special departments of knowledge. A reader is valuable, as he is well acquainted with the technical peculiarities of composing, has at least such a knowledge of ancient and modern languages as shall enable him to know them when he sees them, besides the elements of a good English education.

Conditions of labour. Hours of labour.

He sits on a high stool for the most part whilst pursuing his avocation, but some more commonly stand. When engaged during the day, the hours of attendance are from about 9 a.m. until 7 or 8 p.m., with an interval of about two hours at dinner and half an hour to one hour at tea; but whenever the compositors have extra work the reader has extra work also. Hence late hours in nearly all offices are common, and irregularity, within certain bounds, is the rule, and not the exception. When engaged in night-work or on the morning newspapers, the reader usually comes to the office about 5 p.m. and leaves at 3 to 4 a.m., but when engaged on a Sunday paper he spends the greater part of the three last days and nights of the week at the office.

Closets.

In all book offices, each reader, with a boy, has a closet, as it is termed, for his own use, which is almost always ill ventilated, and placed in a corner to be out of the way, but some closets occupy one side of the room in which the compositors are engaged. The closet is almost universally very small, as, for example, 6 ft. × 4 ft. or 10 ft. × 6 ft., and one which I measured was only 5 ft. square, with an entrance lobby 3 ft. square. The height of these rooms varies from 8 to 11 ft., and the cubic capacity in the three cases just mentioned was 240, 600, and 300 feet. In some large offices the readers' rooms are separated from the composing rooms, and are placed together in one row or in a double row, with a passage running between them. The air which is supplied from such a passage or from the composing room is very impure, and at the same time the reader finds it inconvenient to open the window on the other side of his room, except when the room is intolerably hot and foul from the consumed gas, lest he should take cold. In many closets

Defective ventilation.

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there is some attempt at ventilation, either by an opening into a disused chimney flue, or by a single pane of glass in the window, which is either perforated with holes or is constructed so that it may be opened. These are usually ineffectual, either by reason of the smallness of the opening into the flue and the feebleness of the current, or by defeating its object, in allowing so large a volume of cold air to enter by the opened window that the window must be kept shut. Hence, as a rule, the reader is found in a small den, black and unwhitewashed, ill lighted and ill ventilated, with any opening in the window or door pasted over, to prevent the admission of air, and in this he may be found almost without intermission throughout the whole period of his employment. In some offices the room has the above-mentioned characteristics, except that it is double the size; and in the newer ones, while the rooms are small, they are better lighted and are cleaner, and perhaps placed in better sanitary positions. In others, however few, and those chiefly connected with the newspaper printing, several readers sit in the same room, and the sanitary conditions are perhaps as good as the case admits of.

Suburban residence.

Usually the reader lives in the suburbs of London, and not only has the advantage of a walk to and from the office, but when at home breathes a tolerably pure air.

Evidence of health.

He is, however, commonly pale and thin, of a depressed and anxious aspect, very sensitive to the influence of temperature, of a nervous or irritable temperament, with a dainty yet not a very bad appetite, imperfect digestion, liability to headaches, giddiness, and affections of the eyes, which assume the form of inflammation, short sight, or blindness, so that spectacles are a common appendage of a reader. Many also complain of much general debility and exhaustion, lassitude and piles. Some suffer from prolapsus of the bowel and bronchitis, but consumption is the goal to which they very generally tend. There are, however, some who are of moderately full habit, with good complexion and good appetite for food.

Income.

The salary is in all cases a fixed weekly payment, but varies from 24*s.* to 50*s.* per week, according to the aptitude and general efficiency of the reader.

Food.

The usual meals are breakfast, consisting of tea, coffee, or cocoa, with bread and butter, or toast, and usually with an egg or bacon; lunch of bread and butter; dinner of meat and vegetables, commonly taken in the office. Tea, with tea and bread and butter, prepared in the office, or sent from a neighbouring coffee shop; and supper of meat and bread, or bread and cheese, fish, or other sapid food. As a whole, the quantity of food eaten is somewhat small, and the quantity of beer drunk varies from half pint to one pint daily.

Sickness and mortality.

Readers are eligible for admission into the sick society, if any exist in the office; but there is a social and literary society for the correctors of the press only, the secretary of which, Mr. Pincott, has favoured me with the following returns in reference to sickness and mortality.

"Choosing 100 as a convenient number for statistical purposes, I "obtained returns from the principal houses in the trade, to wit, "Messrs. Hansards', Bradburys', Gilberts', Savills', Spottiswoodes', "Her Majesty's, Kelly's, Smith and Elder's, Clay's, and Cox and "Wyman's, and it will be understood that these statistics apply to "100 readers * during 10 years.

* Taken by adding the complement of one printing office to another until the number was completed.

" Questions submitted, and their answers.

" *Question* 1. 'The number of weeks' sickness yearly experienced " by any given number of readers.'

" *Answer.* 'Average ; 2·75 weeks per man per year.'

" *Question* 2. 'The diseases then afflicting them.'

" *Answer.* 'Phthisis pulmonalis, bronchitis, heart-disease, nervous " complaints, incipient amaurosis, congestion of the brain. They are " peculiarly liable to epidemics from the exhaustion induced by the " length of time they work, and the generally unhealthy character of " the places in which they are employed.'

" *Question* 3. 'The mortality yearly, with the causes of death, " and the average age at death.'

" *Answer.*—'MORTALITY. The deaths in 100 *readers* during " 10 years give 2·3 as the yearly average.

" [This rate is liable to fluctuation.

" During the two years I have been secretary to the association " the average death-rate of the *whole profession of readers* has " been :—

" 1862 . . 2·5.

" 1863 . . 3·3.

" This question of the mortality of readers is a difficult one to " answer, owing to the fact that it does not necessarily follow " because a man becomes a reader that he dies one. Many are " forced into other occupations, from the failing of their eyesight ; " whilst others voluntarily become managers, reporters, sub- " editors, editors, or occupy other positions in connection with " literary pursuits.]

" CAUSES OF DEATH.—Chest diseases, nervous affections, and " effusion of blood or serum on the brain.

" AVERAGE AGE AT DEATH.—45 years."

Hence the sickness is considerable, and the yearly mortality is 1 to 44 living.

Compositors.

Compositors.

Mode of labour.

Compositors always work in association, the number varying from two or three to more than 90 in one room. They may either sit or stand at their employment, but it is more usual, more healthful, more conducive to an erect figure, and more convenient, to stand during the greater part of the period of labour, and to sit only temporarily as a relief. They are placed before a frame on which are found one or two cases containing the type, and which fall from them at an angle of about 60°. The elevation of the frame is between five and six feet, whilst its length is six feet, and the "bulk" at the end of it two feet. The width between the frames is 21 inches. According to the size of the room, there will be one row of such frames, or there may be two rows, between which is a double gangway, and a bench called "the stone," upon which the corrections are made and the "forms" made up. Hence the compositor stands in a space $7\frac{1}{2}$ to 8 ft. × 4 ft., and of varying height ; but when the frames are double, that is, when two compositors are standing together, but with their faces and their frames in opposite directions, the average space for the two between the frames is lessened. As a rule, there is only one compositor to a frame, in book offices, but in newspaper offices two stand at the same frame side by side.

APPENDIX.

Nos. 8–12. *Industrial Diseases.*

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Cubic space allowed.

The following are a few measurements which I made in both newspaper and book offices :—

No. of office.		
2	For one man	10 ft. × 4 ft. × 12 to 15 ft.
2	"	16 ft. × 3½ ft. × 11 ft. ;
10	For 20 men	60 ft. × 20 ft. } rooms lofty.
13	For 30 men and 21 gas lights	45 ft. × 21 ft. } rooms lofty.
14	For 16 men and 11 argand burners	20 ft. × 30 × 7 ft. to the plinth, and 13 ft. to the ridge of the roof.
21	For three men the proportion of a large room	12 ft. × 12 ft. × 10 ft. average.
28	For eight men and 15 fish-tail burners	7½ ft. × 30 ft. × 21 ft.
32	For 90 men and 160 gas lights	104 ft. × 30 ft. × 11 ft. to the plinth × the height to the edge of the roof.
34	For 35 men and 35 gas lights	66 ft. × 24 ft. { The roof is comparatively filled with sheets of paper hanging to dry.

Probably the best room which I have seen, from its dimensions and elevated situation, is 74 ft. × 42 ft. × 24 ft. to the apex of the skylight, and in this and a room adjoining (with a series of reading-closets), measuring 62 ft. × 30 ft., from 70 to 90 men are employed. In the larger room there are 36 and in the others 24 gas lights.

Those in offices Nos. 28 and 34 afford only 500 and 450 cubic feet of air for one man and one gaslight, and in them the means of admission of air are very restricted. An allowance of from 480 to 600 cubic feet for each compositor and his gaslight seems to be about the rule in the offices which I have visited ; but the offices differ extremely as to the rate at which the air thus supplied may be renewed.

Degree of exertion.

Almost the sole occupation of the compositor is to pick up the different letters of the type with great rapidity, and place them in a "composing stick" when making them into letters and lines, and he is never required to move the body from one spot, except when he makes up his type into "form." There is scarcely any general muscular exertion in picking up the type, and the labour is restricted to the maintenance of the standing posture and the movement of the arms and shoulders ; but as the "forms" are heavy much muscular exertion is required when moving them to and from the "stone." When the "case" is sufficiently high there is no necessity to bend the trunk at all, but when it is low in relation to the height of the compositor, or when he is correcting at the stone, the trunk bends, and the shoulders are apt to become rounded. It is also a very general habit to work without the coat and in the shirt sleeves only, a circumstance due to the heat of the room, but in its turn rendering the heat of the room necessary to his comfort. A few only exchange their ordinary coat for one with tight sleeves, which is fitted to protect the body from cold, whilst it does not impede the use of the hands and arms. The cases are also comparatively few in which a cap is worn, and thus the effect of cold air on the uncovered head is at once perceived.

Composing rooms.

The rooms in which the compositors labour are exceedingly diverse in character. The older offices consist simply of ordinary houses which have been altered more or less for the purposes of the trade.

In such cases the rooms are small, and of only the usual height of dwelling rooms, and with one or more windows which open by the half moving up and down vertically. The ventilation proceeds through an opening in the chimney or through a perforated pane in the window; and as the light is admitted only on one side of the room, and the compositors are placed close to it, they cannot tolerate the opening of the window, or even the passage of the cold air through the perforated glass, and consequently keep the windows shut, paste up the chinks in the sash frame, and cover the ventilators. The employer has often exhibited a laudable desire to improve the ventilation by openings of various kinds; but from the cause just mentioned, and from the fact that the other openings lead into adjoining rooms or passages containing foul air, the ventilation is always very deficient. Indeed, in no office have I seen such rooms even moderately ventilated; and when the gas has been lit for even a short period the heat and gas fumes are intolerable to one unaccustomed to them. Ventilation.

In many cases of this class the number of persons remaining in the room is but small, and the evil is proportionately less, but in others the space is as fully occupied as is possible, so that in one office 35 men were found in a room, made out of several rooms, 22 yards × 8 yards. Such establishments have, moreover, narrow and intricate staircases and passages impeding the admission of air; and when, as is not unusual, the rooms and staircases are almost black, and the latter covered with dirt, anything more repelling could scarcely be imagined.

When a large establishment has grown by degrees in such premises, the yard is commonly covered in, and used as a machine room or composing room, and this not only prevents the entrance of fresh air, but retains the foul air, and distributes it to all the rooms in connection with it. Hence no system of ventilation could be adopted in the several rooms which could be in any degree effective.

The confined space in which the overgrown establishment is found is in some instances disgraceful, and cannot be excused on any ground, if the pecuniary interests of the employer are held to be a less worthy motive than decent sanitary provision for the employed.

Most of the larger establishments have been built for the purposes of printing offices, and have larger rooms, more abundant windows, wider staircases, and special provision made for ventilation. The newest of them may be reasonably expected to be the best, whilst those which were built 20 to 50 years ago, and enlarged as occasion has required, are yet in all respects far better than the houses above referred to. Such are also kept in a cleaner state, both in the rooms and passages, but even there the use of whitewash and the thorough cleansing of the rooms is a very rare occurrence. The best arrangement which exists is that in which the room is open to the roof, either when situated at the top of the house, or when consisting of one story only, for not only is the cubic capacity of the room necessarily increased, but the opportunity for ventilation is the most complete. In some instances, and those in the less modern buildings, the height to the plinth is too little and the roof too flat, whilst at the same time the room is narrow, and every available spot occupied by frames, or stones, or forms. On the other hand, in several of the most modern offices the rooms are broad and spacious, and the centre of the roof 20 to 30 feet high.

In a room of this character I have found the following expedients for ventilation:— Different methods of:

1. The side windows, which in some rooms are numerous, whilst in others they are restricted to one side. These open usually Windows.

in their upper part, and not unfrequently by a central pin upon which they swing, one part moving inwards, the other outwards. In a few cases some of them are kept permanently open to the extent of one inch at the top and bottom. Other windows do not open bodily, but have a V shaped ventilator, as in churches, which allows the air to enter at the upper extremity only. Besides these are the expedients of opening a single pane, or, having panes of perforated glass.

There are, however, several large composing rooms in which there are not any side windows, and in which the light is admitted only from above.

As a general rule, it is found that during cold weather the compositors will not allow air to enter by a side window, so long as they remain near, whilst others who are distant from it often desire it. Under such circumstances there are a few offices in which it is a rule to open the windows during meal hours; but generally this is prevented by those who remain in the rooms and take their meals whilst sitting between the frames.

Skylights.

2. The skylights. It is very rare that the whole of a skylight is fixed, but usually a part of it is made to open by horizontal slides, or by swinging on a central axis, or by a portion of it at the centre being lifted up bodily from the roof. These openings, are, however, usually so large as to admit large volumes of cold air, and unless the elevation above the heads of the compositors be 15 to 20 feet the cold draughts cannot be borne.

3. At the lower line of the skylight and near to the plinth an opening is left in the wall all round the roof, which on the outside is defended by fixed venetian shutters, and on the inside by solid shutters, which may be raised in sections at pleasure. This opening is generally large, and consequently the inside shutters are kept closed.

4. In one case, and in the position just mentioned, the opening on the inside is defended by perforated zinc, and does not exceed two inches in depth. Hence a moderate and permanent current will be induced.

Tubes.

5. Tubes of various kinds inserted in the side but more usually in the ridge of the roof, and capable of being closed at pleasure. In several offices where great efforts have been made to improve the ventilation these tubes are doubled so that there is one placed inside the other, with an interval between them, and one, it is said, is somewhat longer than the other. In some cases there is a horizontal flange at the lower end of the tube, with a view to distribute the cold air as it is allowed to descend into the room. The ground for the double tube is, that the current will set outwardly in one and inwardly in the other tube; but after an experiment made by me at each of the places it was found that the direction of the currents was the same in both tubes alike. These tubes are usually of large size; and when a single tube is used, having a large diameter, it is easy to prove that there are two opposed currents in it; for if a large piece of flaming paper be held at various points at the mouth and within the tube, it is observed that the flame is carried upwards and outwards, whilst the smoke from the ignited paper passes onwards and inwards.

In a majority of cases the tube may be closed by a valve, and in one office the ropes by which the valve may be moved are locked up, so that the compositors cannot close the tube at their pleasure. In others there is no valve, but at the top a flat piece of board or metal is placed across the aperture, which is either fixed or moveable. In the former case there are apertures on the sides through which air is admitted; and in the latter, when the valve or cowl is raised, the whole aperture is exposed, and a large volume of air at once descends. In the most perfect arrangement the upper opening is defended by a cowl, which moves with the wind, and prevents a direct descent of the column of air.

When the elevation of these tubes is sufficient, there can be no doubt of their superiority over the other modes of ventilation.

6. Openings into flues. In every case I have tested the currents, and, whether there was a fire in the grate or not, there was always a current outwards. Flues.

7. Similar openings in the side wall, either left naked or defended by a V shaped ventilator, or in a few cases having simply an air grating placed upon the outer side. Air bricks.

8. Air gratings placed near the floor, and communicating directly with the outer air. These were placed close to the feet and legs of some of the compositors, and could not be tolerated, and hence were covered with paper or board.

In reference to nearly all these alike it is found that the amount of air which they admit varies with the direction of the wind, and that when the direction of the wind coincides with their apertures the draught is increased, and becomes intolerable; whilst in the opposite condition the current of air is insignificant and ineffectual. Variation in the effects.

It has also been found, that however good the system of ventilation may be, it is, on the one hand, defeated as far as possible by the efforts of the compositors to close every opening, and on the other, however it may carry away foul air during daylight, it is comparatively powerless when a large number of gaslights are lit. Thus in one room, with many large ventilators, in which 90 men work, and 167 gaslights burn, the heat becomes almost insufferable; but in an hour after the lights have been extinguished the ventilators suffice to carry off the excess of heat and the accumulated foul vapours. The effect of introducing the ventilators has, however, been to lessen the moisture of the air, so that streams of fluid no longer run down the windows or drop fall from the skylight, and the air has lost its murkiness, even when all the gaslights are in operation. Impediments offered by the compositors.

There are numerous instances in which a lower room is ventilated by a staircase, or by a very large oblong opening near the centre of the room above, and in a few this is so arranged that a skylight opens directly above this staircase or well. As no provision is made for the admission of fresh air into the room below, the ventilation of the lower room remains imperfect, whilst the heated air from the lower room ascending into the upper adds to the heat of the latter, and the room becomes almost intolerable. It also not infrequently happens that fumes from a foundry or foul odours from machinery or sinks rise from the lower room and aggravate the evils of the upper one.

The heated air of the lower rooms always tends to heat the upper by warming the floor, and when the rooms are low, and the consumption Effect of gas.

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of gas great, this is a serious evil, and one only surpassed in the case where the steam boilers are placed in the lower room, and supply unwished for heat to the whole house.

In reference to a middle or lower room, I found some instances in which wooden tubes were carried from the ceiling of that room through all the upper rooms to above the roof, a length of 15 yards, and through which a strong current ascended.

Ventilation of middle rooms. The lift.

It must also be added, that in nearly all properly adapted offices there is a "lift," which passes from the bottom to the top of the building, and in its use must act as a ventilator to all the rooms. It is, however, much to be regretted that the air to be thus supplied from the bottom of the building is close, and when the machinery is in operation is as warm and foul as that in any other part of the office.

Insufficient ventilation.

Such are the various kinds of ventilation in use; but as a general expression it may be stated that universally the ventilation is defective, and quite insufficient to remove the heat and the products of the combustion of gas in the evening and during the night, and that in many offices, and particularly in those made from dwelling houses, the condition is most deplorable. This is partly due to the difficulties of the case, and partly to the determination of the compositor to prevent ventilation; at the same time it must be added that both employer and employed are fully alive to the magnitude of the evil, and wait for science to devise plans whereby good ventilation may be effected under diverse conditions, and in all cases without causing a perceptible draught; also, that with all the existing defects it is only in the worst offices that the air is saturated with moisture, except when the day is unusually moist and warm for the season of the year. (For analyses of the air in printing offices see supplement to this Report.)

Analyses of the air.

Warming of the rooms.

The usual method of heating the compositors' rooms is by hot water or steam tubes, both of which cause much variation of temperature, from the intermittent manner in which the heat is supplied, and the very varying degree of heat. As the tubes are usually placed around the sides of the room they distribute heat very partially, and as the compositor stands with one of his legs near to the tube he complains that one leg is burnt whilst the other is cold. This tends, it is said, to induce the printers' sore leg disease in one and rheumatism in the other. Open fire-places are found in one of the largest offices, but in general they are supplanted by the steam pipes.

Duration of labour.

The periods of labour may be arranged under three heads, viz., night work exclusively, night work chiefly, and day work chiefly; the two former found in the morning newspaper offices, and the latter in the book and weekly newspaper offices.

Night work.

Night labour exclusively begins at from 5 to 9 p.m., according as the compositor has yet to distribute or has already distributed his type, and continues until 3 to 5 a.m.; and the daily routine is as follows:—Go to bed about 6 a.m. Arise, 12 to 2 p.m. Dinner, 1 to 4 p.m. Take tea at 5 p.m., either at home or at the office. Enters the office at 4 to 6 p.m. Supper, at 10 p.m. cooked in the office or sent in from the cook's shop, with beer or coffee. About 2 a.m. a cup of tea or coffee, or more commonly one, two, or three half pints of porter are taken between the supper hour and the period of leaving the office. 3 to 5 a.m. leave the office, and in many cases they walk two miles before reaching home. Too generally, perhaps, they go to an early public house which opens for their accommodation, and drink beer and perhaps eat a chop before going home.

When they go directly home, some take breakfast before going to bed, whilst others go to bed at once, and take breakfast two or three hours before arising. Hence they usually take four or five meals in the 24 hours, one or two of which always consist of meat; and about three pints of porter, with or without gin or other spirits, are commonly (but not universally) drank in the 24 hours.

I found many who had pursued this course for periods varying from 20 to 36 years, and who affirmed that they could eat and digest their food as well during the night as during day, and sleep as soundly during the day as during the night. Some, however, stated that the light and noise of day prevented sound sleep, but had no other injurious influence; whilst others made their rooms dark, on the belief that the light would be injurious to their eyes. All affirmed that after the first few years they could work as rapidly and as comfortably in the night as in the day, and that the night work was not in the least injurious to their health, and as it is more remunerative than day work, brings them less in contact with their employers, and allows them several hours in the middle of the day to pursue their own pleasures, they would not exchange the night for day work.

In some offices there are both day hands and night hands.

Mixed day and night work.

On the conjoined morning and evening papers there is a mixture of day and night work, in the following manner:—The majority of the compositors are engaged at the office from $11\frac{3}{4}$ a.m. to $2\frac{1}{2}$ p.m., and again on the same day from $5\frac{1}{2}$ p.m. to 2 a.m. on the next morning; and it not unfrequently happens that the compositor prefers to engage another to perform his task for one night, so that he is engaged only five nights per week. Some, however, and these the most steady and thrifty, work the whole six days in the manner indicated. The daily routine in such a case is as follows:—10 to 11 a.m. arise. $10\frac{1}{2}$ to $11\frac{1}{2}$ a.m. breakfast. 11 to $12\frac{3}{4}$ at the office. $2\frac{1}{2}$ to $3\frac{1}{4}$ p.m. (as they stay to distribute the type or not) leave. 3 to 5 p.m. dine at home, afterwards lie down on the sofa until $5\frac{1}{2}$ p.m., when tea is taken at home. $6\frac{1}{2}$ p.m. at the office. $9\frac{1}{2}$ to $10\frac{1}{2}$ p.m. supper. 2 to $3\frac{1}{2}$ a.m. leave, and at $3\frac{1}{2}$ to $4\frac{1}{2}$ a.m. go to bed, in some cases having taken beer, spirits, or coffee and bread and butter and others without any food.

This course is less approved than the night work only since there is less time allowed for sleep in the morning and less leisure during the day, but it is to be observed that the labour is less prolonged into the night. Some find that they cannot sleep well if food be taken before going to bed, but others sleep soundly.

The remuneration at these offices is somewhat peculiar, since all are employed by time, and obtain 1*s.* per hour for composing, the time required for the distribution of the type not being paid for. Hence six nights will yield 52 hours, and four days 11 hours labour and pay, making a total of 63 hours per week, but out of that 13 hours must be taken for the distribution of the type, which leaves 50 hours for a week's work and a weekly payment of 50*s.*, but if a substitute be provided for one night's work the compositor saves eight and a half hours labour, and loses 8*s.* 6*d.* per week.

Day work.

Day work exclusively never occurs throughout the year in any office, but is either supplemented by extra hours, which carries it to 10 or 12 p.m., or the labour is prolonged further into or through the next night, and in some cases through the next day also, so that there may be two days and one night of continuous labour. The usual hours for day work are from 8, $8\frac{1}{2}$, or 9 a.m. until 8 p.m., except on Saturday, when they terminate at 2 p.m., a curtailment which has in most offices

been partially compensated for by beginning work daily half an hour earlier than was the case before the half holiday was granted.

Extra hours.

When the work is prolonged to 10 p.m. the extra hours are paid for at the rate of day work, but when it is extended to midnight threepence per hour additional is given, and when throughout the night the extra allowance beyond the usual hourly rate of day work is 2*s.* 6*d.* Hence night work is generally said to be more profitable than day work to the employed, but less profitable to the employer. This is the kind of work which is admitted on all hands to be injurious to health, because it prolongs the hours of labour and disturbs the habits of the body. I have everywhere sought the opinions of the employed and the employers as to the desirability of the plan, and as to the desire for it, and the following may be taken as a resumé of the answers:

Necessity for and desirability of extra hours and mixed day and night work. As to the employers.

1. As to the employers—

The extra payment which is made for night work, as well as the inferior manner in which the work is often done, with the expense of gaslight and management, render it less profitable, and therefore undesirable; but, on the other hand, so much more work is done by the office upon which a profit is obtained, that the total advantage to the employer is increased. This motive is especially evidenced in those offices where they profess to do any amount of work and in less time than can be effected by other offices, which leads them voluntarily to accept more business than can be performed in the usual hours of labour; whilst there are offices which do not do night work, or even extra work, except with much reluctance, and at distant periods only. To this must also be added the kind of work which the office executes, since some parliamentary work, from its nature, must be done in the night, and at whatever time it is required. Further, in printing periodicals it often, perhaps usually occurs, that the editors and contributors do not send their matter to the office until a period so late than in order to its being printed the compositor must work night and day, and whoever prints such works must submit to this inconvenience until editors adopt a different course. Hence, as a general remark, it may be stated that extra and night work are profitable to the employer; that some employers voluntarily encourage them, and that others are compelled to have them, or cease the kind of business in which they are engaged; but that there are some who, willing to forego the advantages, rarely have them.

As to the operatives.

2. As to the employed—

The universal belief among the employed is that night work is very injurious to health, and that if it were possible they would not have it. The impossibility rests upon two grounds. The employer has work to be done, and although he does not in so many words insist upon any given men doing it, he states that it must be done, and the men, although nominally free to go, are bound to stay and do it, or cease their connexion with the office. Hence the over work is necessary. On the other hand, the pressure of want compels the employed to gladly accept over work, and this pressure may be due to defect of work at other times, to the necessary demands of a large family, or the wasteful habits in which he indulges. With regular employment and fair economy the income of the compositor from day labour suffices to maintain him in respectability. As a rule, the compositor in regular employment, of steady habits, and when married, would avoid extra and night work, whilst the single man, the dissolute, and those in irregular employment, and perhaps to these may be added a few very thrifty men, prefer it. It should also be added that irregular employment is due to

two conditions. First, in parliamentary work a much larger number of compositors are required during the session than at other times, and hence if they are obtained they must frequently lack employment; Second, men of dissolute habits, and also bad workmen, are frequently discharged from their employment, and obtain a precarious subsistence. The former may include men of good habits, and such must be added to the dissolute in their desire for extra work and night work, but, as a rule, a steady and fair workman is sure to obtain regular employment.

Hence it follows that it is only the exigencies of the men which induce them to tolerate extra and night work, and if it were possible for regular work to be obtained, nearly all the steady men would be glad if such extra work were abolished. The demands of the public, the ambition of the employers, and the merited or unmerited necessities of the men, together maintain the present system.

Sunday labour.

In connexion with the subject of overwork it is right to introduce a remark upon Sunday labour. In many morning newspaper offices the compositor attends on the afternoon of Sunday, and in parliamentary offices there is work which demands Sunday labour. It is also probable that in jobbing and book offices there are numerous occasions when the compositors and press men or machine men are occupied during the whole or a part of that day; but I do not think that it is a plan generally adopted throughout the trade. It was remarked to me in some of the offices that lawyers having parliamentary printing to be done not unfrequently sent the copy on Sunday, and the nature of the matter required that it should be set up and printed at once. Sunday labour, in addition to that of the six days of the week, must be highly prejudicial to health; and it is worthy of notice, perhaps, that the highest mortality occurred in an office where this kind of urgent business was carried on.

Income.

The income of the compositor varies much. There are usually two classes in every office; those who are paid according to a scale of earnings, and those who are paid by time; the former termed "piece hands;" the latter "on the establishment." Those "on the establishment" are usually the best and most regular workmen, and as their wages must be paid, the employer will provide them with work first, and usually will reserve for them the most remunerative kind of work, that is work which if paid for by the piece would cost the employer more than the ordinary amount. The weekly payment to such, in union houses, must not be less than 33*s*., but the average payment varies from 33*s*. to 38*s*. per week. Those "on piece" obtain different sums, as they are regularly employed, are quick compositors, make few errors, and have more or less remunerative kind of work; and the wages of such vary from 24*s*. to 44*s*. per week, with an average from 30*s*. to 36*s*. per week. In one office I found that the men averaged £9 per man in one week, in November, whilst composing some unusually remunerative parliamentary (not government) work, and working almost night and day. In many of the larger offices the over work and night work add one or one and a half days income to the usual wages.

The *daily* routine is as follows:—

Routine of life with day work.

With day work only: 7½ to 8 a.m. breakfast. 8½ to 9 a.m. arrive at the office. 11 a.m. lunch. 1 p.m. dinner. 5 p.m. tea. 8 p.m. leave work. 9 to 10 p.m. supper.

With extra work.

With extra hours: If to 10 p.m. only it is not usual to eat further, but some have beer, and others coffee, with bread and butter, at 9 o'clock. When until midnight, a supper at 9 o'clock is sent for from the shop. When throughout the night a meat supper is always taken at 9 p.m.,

and at 3 a.m. a meal of coffee or tea, or beer is taken, perhaps twice, but in many cases no food is eaten during the night. On returning home it is usual to take food before retiring to rest; but as it is customary for the compositor to return to his employment at 11 a.m. the next day, many go to bed at once, and take breakfast only just before they return to their work.

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When the extra work is prolonged through the night and the next day, the food is taken at the same hours on the second as on the first day, and he has the opportunity of sleeping at home on the following night.

Provision for cooking food in the offices.

It must be recorded that, with the exception of one office (that at the head of the newspaper press, and the head of every other printing office in sanitary arrangements), scarcely any provision is made to aid the compositor to obtain food whilst at his work, except allowing one hour for dinner, half an hour for tea, and, during night work, one hour for supper. None provide a room in which the meals may be taken. Many have no open fire-places at which a chop may be cooked or a kettle boiled, and where they exist no utensils or any other convenience whatever is afforded. In one excellent office good tea is provided at 4*d.* per week, which the employed may fetch from below, and take with their own bread and butter. In a very few the tea-kettle may be boiled at a fire-place, and in all hot water may be obtained from the steam-engine boiler, or a chop cooked at the steam-engine fire-grate; but the latter is so rough and uncouth a plan that but exceedingly few adopt it. Hence, practically, the compositor must,

How food is obtained.

1st, go home to his dinner; but when his home is (as it usually ought to be) distant this is impossible; or, 2d, bring cold meat with him, and eat it with bread and beer in the office; or, 3d, get a raw chop or steak, and cook it and eat it in the office, with bread; or, 4th, take his chop or steak to the public house, and cook and eat it there; or, 5th, send for a plate of meat and vegetables from a cook shop, and eat it in the office; or, 6th, go to a cook shop and eat his dinner. When eating his food in the office he usually sits down on a box between the frames, and, wherever it may be, continues to inhale the foul air of the office, and prevent the windows being opened. When he buys a plate of meat he obtains about 3 oz. of cooked meat for 4*d.*, or 5 oz. for 6*d.*, with vegetables of one or two kinds for 1*d.* or 2*d.*; or he obtains half a sheep's head for 3½*d.*, with vegetables, 1*d.* or 2*d.* When he buys a chop or steak he obtains ½ lb. for 4*d.* or 5*d.*, and has much more nutriment for his money. When he cooks his food at the public house, he is led to drink, and to frequent the house at other times. On close inquiry I did not find anyone who believed it to be injurious to take the food in the office, or who could not then digest it well, and they even averred that cold meat, although less palatable, was digested equally well with hot meat. All, however, believed that it was better to take food out of the office, and to have a walk during the dinner hour.

Absence of dining rooms in the offices.

The absence of a separate room, where they might eat their food, of convenience for cooking, and of ordinary decent comfort in eating their meals (considering the respectability of the class of persons so circumstanced, and the improbability of the great majority going home to their meals), is, I think, quite unworthy the times in which we live. The overcrowded state of the premises may be held to render it difficult to provide a separate room, and the abundance of eating-houses to render it less necessary; but, while the former exists, and in a degree which is often disgraceful, the will of the employer would soon find a way for the remedy, and the latter does not afford so much nutri-

ment for the money, or food of so wholesome a kind, as could be readily provided in each large establishment. In small establishments it would be at least equally possible to spare a room and to provide a fire, but as the number of men employed is small the evil of the present system is proportionately less.

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I obtained from the men very different answers in reference to the supposed unhealthy tendencies of the trade, both in ordinary day work and in day and night work combined. The appetite and digestion were generally said to be good, whilst many affirmed that the appetite was capricious, and required dainty food, and others that indigestion was very prevalent. Headaches were not common, but some suffered from them. Nervous affections were rare. Piles, swelled feet, and varicose veins occurred in a few, and particularly in those working long hours. They were very liable to take cold, and some had rheumatic affections from picking up the cold type in the morning, and from variations of temperature. Bronchitis was not uncommon in later life, and other chest affections prevailed about middle life, or from 25 to 35 years of age. Several fatal instances of bronchitis, following the persistent attempts of the employer to keep the windows open, were mentioned to me. After protonged work, a sense of fatigue, exhaustion, and irritability occurred, with a dull condition of the brain, and giddiness; but usually this failed to affect the appetite, and although the next day they were weary and less elastic and happy, the whole effect passed off without having inflicted evident injury.

Unhealthy tendency of the work.

Opinions of the operatives.

Such are the general observations of the men themselves. My own observation showed that by far the great majority of compositors are thin and pale, with large pupils; but even in these cases they declared, generally, that their appetite, digestion, strength, and breath, were healthy—in fact their general health was good, as good as it had ever been. Cases were, however, to be found where the habit was full, the complexion florid, and in which all the evidence of high health existed, whilst in others the fulness of system was ascribed to excess in drinking. The proportion of these seemed to vary in the different offices, and, without being able to trace it to its cause, it certainly was less in the worst arranged offices.

Aspect of operatives.

As a whole I could not arrive at any other conclusion, from general observation, than that they were a sensitive and not a robust race, enjoying life in only a moderate degree, and not peculiarly liable to varied and acute diseases, but with a tendency to defective alimentation and assimilation, and thence towards exhaustion of body and consumption.

Conclusions as to state of health.

Special diseases.

But, besides the question of general health, it must be observed that the nature of the employment leads to abnormal conditions of the eyes, such as congestion, inflammation, short sight, and blindness; but, with the exception of short sight, none came prominently under my observation. It is also commonly believed that the conditions of the employment lead to habits of drinking, and it is universally admitted that snuff taking is the besetting sin of the compositor.

I was also informed in many offices that the type itself, and particularly copper-faced type, was the cause of disease, by poisoning the system. This was explained in various ways. Thus, when new type is used, it cuts the fingers, and whenever the skin is cut, from whatever cause, the particles of the type are then supposed to be absorbed, and to produce a poisoned wound. It is customary to wet the type before distribution with a solution of potash, which oxidizes the surface; and, as the type is distributed when wet, the salt may enter a wound on the hand, or be conveyed to the eyes, or the mouth, by the unwashed

Effect of the type on health.

fingers, and thus be readily absorbed. Moreover, in correcting, many compositors place the type in their mouth, and thus acquire a habit known as "chewing type." Whatever particles may be detached from the surface of the type will thus pass into the alimentary tract, and, if they are capable of solution, may be absorbed and carried into the system. It was also formerly common to dry the type thus wet before the fire, and often to allow it to become quite warm, in which state it was assumed that some emanation proceeded which was very generally affirmed to be unhealthy. Since open fire-places have been abolished this source of injury has been greatly reduced. Case dust was also very generally affirmed to be injurious, and the compositors were usually protected from its influence by having the dust blown from the type with bellows in the open air, but in many it was blown by the breath into the rooms in which the compositors worked, and the dust was thus inhaled. The assumption was that this was more than ordinary dust, and that it produced in a certain degree poisonous effects. On examining it, it was clear that the weight was greater than that of ordinary dust, and as the type must wear by constant friction in the case, it was highly probable that fine type-dust would be mixed with it, and hence, that in type-dust portions of antimony, arsenic, and lead, in however small a degree, would be found. Samples were taken, and submitted to Professor Miller for analysis, who found in 100 parts—

Analysis of type dust.

Lead	9·44
Copper	1·81
Antimony	1·00

with a trace of arsenic, and a notable quantity of iron. Hence there are good grounds for the opinion that the inhalation of case dust is injurious to health.

Among printers diseases, poisoned hands and dropping of the wrists are certainly found, and numerous cases (very few in comparison with the whole number of compositors) were mentioned to me.

Sickness.

The amount of sickness and mortality occurring among them was not easily ascertained.

Sick Clubs; Their regulations.

In a large majority of the offices there are sick clubs, which afford sick pay during sickness, and some of them provide a small sum at the death of a member. For the most part these are supported by the men solely, and admission is quite voluntary, whilst others receive aid from the employers, and all persons in their office are expected to be members of it. Some admit apprentices of any age; others only after their first year of apprenticeship; others only during the last year of apprenticeship; whilst others exclude them altogether, but admit persons on equal terms of all ages beyond. In none is there a medical examination as to the state of the health on admission; whilst in most of them the persons proposing a member, and those ballotting for his election, are presumed to form an opinion as to his state of health, but there are exceedingly few cases in which rejection on the ground of health has taken place. Yet there is the limitation that none who are manifestly very ill would be engaged by an employer, or being already engaged none such would offer themselves as members. Hence, except in extreme cases, there is no limitation on the ground of age or health.

Their temporary character.

So, in the other arrangements of the club, there is no pretension to place them upon any sound scientific basis, which shall estimate the probable amount of sickness throughout life, and the payments necessary to meet such demands. They are essentially temporary institutions, intended to relieve the necessities of the year, and for the most part dividing the funds (leaving a small sum) at the end of each year.

The in-payments and out-payments vary very much, and are not the same in any two offices. But, as a general expression, it may be stated that the in-payments are 2*d.* to 3*d.* per week for each member, and half that sum for each apprentice, or half member, whilst the out-payments are usually from 6*s.* to 12*s.* per week for a given number of weeks, and half that amount for a further equal number of weeks, after which no payment is made within a year, the year being in some cases the solar one, whilst in others it commences from the period when the members last received relief. In some clubs the weekly payment is so high as 6*d.*, in some there is no half pay, and in others the whole term of payment is limited to six weeks in one year. In some offices (and necessarily in those not recognised by the trade union), when the member leaves the office he leaves the club, whilst there is a union of other sick societies by which a member going to another office becomes a member of another society. Besides this, it must be remembered that many persons leave the societies by reason of nonpayment of the weekly subscription.

In-payments and out-payments.

Hence there are three circumstances which militated against my obtaining entirely trustworthy returns from these societies :—

Returns not trustworthy.

1st. The fluctuating population belonging to them. This is due in part to the fact that young men come from the country to improve their knowledge of the business, and after remaining for a year or two, return home ; and in other part, to the operatives changing their place of employment.

2nd. The probability that the members do not at their admission represent the average state of health of the community, for there is medical examination made into the state of their health on admission.

3rd. The number of weeks sick pay do not necessarily represent the number of weeks illness, for, on the one hand, a printer is able to work with an amount of disease which would effectually disable a person exposed to the weather and engaged in a laborious occupation ; and, on the other, after a certain number of weeks' sick pay, he is not allowed to have more until one year shall have expired, and if he should then leave the shop from permanent inability to labour, he is altogether excluded from the sick society.

The average age of the members of the societies which I investigated during the period referred to varied from 34¼ years to 40, and the average age of the members at death varied from 29 to 52 years, and on the whole average was 43·1 years.

Average age of living, and at death.

The Registrar General has favoured me with the returns of mortality amongst printers in London in the years 1860 and 1861, and these are exhibited in the following table in contrast with the mortality amongst agricultural labourers in the same years :—

Returns of Registrar General.

ANNUAL MORTALITY PER CENT.

Ages	15 to 20.	20 to 25.	25 to 35.	35 to 45.	45 to 55.
Printers	0·440	0·698	0·894	1·747	2·367
Agricultural labourers	0·423	0·762	0·743	0·805	1·145

Showing an increased mortality in printers at these ages, and in middle life more than twice the mortality of agricultural labourers.

Experience of Widow, Orphan, or Nominee Fund.

The experience of "The Metropolitan Typographical Widow, Orphan, or Nominee Fund" affords a much higher rate of mortality

than either of the sources yet referred to. Thus, Mr. Neison, in the quinquennium ending in 1860, found that the deaths had been 47·6 per cent. higher than those of the whole community, and in the preceding quinquennium the excess was no less than 60 per cent. This great disparity in the two periods leads to the presumption that there were disturbing causes acting in a degree far above that affecting the whole community, and prove that the results hitherto obtained will not necessarily represent the true mortality in the trade. That such must be the experience of this society may be inferred from the fact of its recent origin, and the certainty that a large proportion of the applicants would be advanced in life and less healthy than the average of the trade. Ten years were quite insufficient to determine the normal rate of mortality, and an excess of aged and unhealthy persons would swell the mortality in the early years. No medical examination was made as to the state of health on admission, and even now, so imperfect is the basis of this society, that the only test of health is a declaration by the applicant, and the opinion formed by the members. What may be expected from so patent a defect but that sickly members will be admitted, and that the mortality will be excessive, although it may diminish within certain limits, as it has done over a period of five years?

Mr. Neison's statements.

Defects in the arrangements of the fund.

Mean age at death.

The mean average age at death in 10 years was 49 years, and the mean duration of life during life varied from 40 to 44 years.

Causes of death.

The causes of death, as recorded by the sick societies in 129 deaths, were—

Bronchitis	18
Consumption	61
Stricture	1
Bad leg and mortification	1
Apoplexy	7
Paralysis	4
Heart disease	5
Temporary insanity	4
Old age	6
Brain disease	1
Nervous disease	1
Rheumatic fever	1
Gout in the stomach	1
Rheumatic gout	1
Dropsy	3
Ditto and rheumatic gout	1
Diseased liver	1
Inflammation of lungs	4
Cholera	1
Spasmodic cholic	1
Abscess of bowels	1
Inflammation of the bowels	1
Fever	4

So that consumption occurred in 46·7 per cent. and chest diseases in nearly 70 per cent. of all the cases.

Consumption and chest diseases.

The causes of death in the members of the "Widow, Orphan, or Nominee Fund" were, in 168 deaths:—

Consumption	76
Diseases of the chest (lungs and heart)	117

It is probable that some cases of consumption were included in the general term "disease of the lungs" which I have entered under "diseases of the chest;" but, taking the numbers above given, consumption occurred in 45 per cent. and diseases of the chest in 69 per cent., numbers corresponding with those derived from the returns of the sick societies.

If we compare this with the mortality from consumption in London in 1851 in persons aged 20 years and upwards, and in relation to the whole mortality at the same period of life, we shall find it nearly double of that of the ordinary community, the proportion in the latter being 24 per cent. and in the former 46¾ and 45 per cent. When the whole of the "diseases of the chest" are calculated in the same manner, it shows that in the whole country the proportion is 48 per cent. of the whole mortality, whilst among printers it is so high as 70 per cent.

Compared with the general community.

With such facts before us it is perhaps not very important to quote statements which are less capable of being substantiated; but as consumption was known universally to be the chief cause of death among printers, I questioned many of the compositors as to the probable number of persons with whom they had been personally associated who had died of that disease since they had been engaged in the business. The following are a few of the answers:

Statements of separate operatives as to frequency of consumption.

Office Number.	
7.	Had known 5 deaths from consumption.
10.	„ 15 to 20 deaths from consumption in 43 years.
11.	„ 9 „ 14 „
12.	„ 30 „ 20 „
13.	In 40 compositors there had been 4 deaths in 6 years, and had known 30 deaths in 20 years.
14.	On one of the morning papers had known 20 deaths in 21 years.
17.	Had known 20 deaths from consumption in 27 years.
20.	Had known 15 to 18 deaths from consumption in 15 years.
23.	Of 23 who came from Scotland with him, 7 had died of consumption
33.	Had known 14 deaths in 15 years.
	„ 5 „ in the last 2 years.
	Another compositor in the same office had known 30 to 40 deaths in 15 years.

Hence it seems sufficiently proved that the great foe of the printer is consumption and other forms of chest disease, with a state of low vitality and deficient alimentation of the body, almost certainly leading thereto; and it may not be doubted but that the whole excess over that of the general community is due to the unhealthy conditions in which he is placed, and to causes quite preventible.

General conclusion.

These results, however, apply to all the branches of the printing trade, and do not therefore refer to compositors only. In order to meet this objection, I have ascertained the ages of the compositors alone in nearly all the establishments visited, and purpose to compare the proportion of each period of life with the proportion which the same period holds in the general community; for if it be shown that the advanced ages occur as frequently among compositors as among the community, as a whole, it will probably follow that the mean

Age of compositors as shewing early mortality.

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duration of life will be the same in the two cases. For this purpose I have ascertained the number of male persons living in London aged 20 years and upwards in 1861, and determined the per-centage of the subsequent periods upon that number, and as the ages of printers in my returns commence at 21 years there will not be much error in the comparison of the two.

Thus:

	Aged 20 to 25.	Aged 25 to 35.	Aged 35 to 45.	Aged 45 to 55.	Aged 55 to 65.	Aged 65 to 75.
Per cent. of the whole population aged 20 and upwards in 726,205 of the general community	16·7	29·5	23·4	15·7	9·0	3·8
Per cent. of 1,249 compositors aged 21 and upwards	Aged 21 to 25. 17·2	38·0	24·5	12·4	6·5	1·0

This comparison proves that there are fewer persons relatively to the whole above 45 years of age among compositors than in the whole community, and thence it becomes highly probable that the duration of life of the former is less than that of the latter.

The records of a sick society composed of compositors only, placed side by side with those of one admitting all the other operatives in the same establishment, show that the mortality among the compositors was 60 per cent. greater than among the other classes.

Female compositors.

I visited and carefully enquired into the sanitary state of the female compositors employed in Miss Faithfull's establishment, and did not hear of any case in which injury to the health had followed the occupation, during the four years which have elapsed since it was founded. Care is taken to provide men to perform the laborious duty of lifting and carrying the chases and forms, so that the compositors have simply to compose the type and make it up into pages. Overwork and night-work are not allowed, and the hours of ordinary labour are fewer than in other establishments.

Pressmen.

Pressmen.

Mode of labour.

The occupation of the pressman is laborious, and brings into violent action nearly all the muscles of the body. Usually two work together; one working a roller upon the ink table, and then inking the type; the other laying the sheet of paper, and pulling the press; and alternating these duties at pleasure. The former is said to be the hardest labour; but it varies with the nature and condition of the ink, so that the adhesion between the roller and the ink table varies greatly. Both hands are in use, and the muscles of the chest and arms are chiefly engaged. The latter varies with the size of the press, and consists in pulling with the right arm a handle describing an arc of nearly

Effect of.

45 degrees, and requiring the pressman to draw backwards, and to bend downwards as he pulls the handle towards him. It is also usual, in order to obtain the required power, to place the right foot forwards upon a flat or obliquely placed surface, so as to offer a strong point of resistance. No one can perform the task for the first time without being astonished at the apparent ease with which those even slightly-built men effect it who have become trained to it, and without causing the arms to ache for a long period after making 3 or 4 pulls. Yet the

ordinary rapidity of this act is 250 times per hour, and youths, and men advanced in life, alike continue it during the whole day. The right arm and shoulder are usually more developed than the left, and the muscles are hard, and resisting on pressure. It is not very uncommon to find a bulging of the right or roundness of both shoulders. The veins of the arms are usually large, and particularly after working some hours. With so much severe labour a large amount of food is said to be necessary; but precise inquiry did not show an amount much above that eaten by compositors. The breakfast is commonly the same in both classes. At the dinner it is perhaps more usual for a pressman than for a compositor to eat half a pound of chop or steak, and at supper it is more common for the former to eat meat; but unless the returns were taken from a large number of persons it would not be easy to show that there is much difference in the quantity of food eaten by the two classes so differently placed with regard to labour. It is, however, very probable that the food which is eaten is more perfectly digested by pressmen than by compositors, since good appetite, good digestion, muscular body, and a nearer approach to a healthy aspect, are more common among the former than the latter. But as to the use of beer and spirits, general testimony proves that while persons greatly given to excess may be found in both classes, the majority of pressmen take more stimulating drinks than compositors. It must, however, be added, that teetotallers are found at press work, and that the experience of such persons, as well indeed as the belief of many who drink so large a quantity of beer, show that the duties of the pressman can be as easily and efficiently performed by the abstainer as by the drinker, and as teetotalism leads to economy the wife and family gain as the publican loses.

Teetotallers.

The wages of the pressman are from 25*s.* to 30*s.* per week, but vary much with the diligence of the operative.

Income.

The conditions in which he is placed in the office are somewhat less unfavourable to health than those already referred to, since the labour promotes respiration and assimilation, the constant movement of many persons improves ventilation, and there are much fewer persons employed in the same space. On the other hand it must be remarked that they never occupy the top room of an office; and if the room in which they work have a roof with a skylight, it is generally an inclosed yard, itself impeding ventilation, and exposed to emanations from sinks or urinals or other offensive sources. Hence, were it not for the last item referred to, it is probable that the condition of the air which they respire would be somewhat worse than that of a majority of compositors. Further, it must be added, that the heat in the press-room is generally very great at night, and this acting with the violent exertions causes profuse perspiration, tendency to take cold, thirst, and a desire to drink beer or other fluids. The handling of the damp sheets is also said to induce rheumatism.

Sanitary state.

The diseases to which they are subject and their mortality have been referred to when speaking of the sick clubs. It is probable that varicose veins, piles, rheumatism, and bronchitis are more frequent in this class than among compositors.

Machine Minders.

Machine minders.

The machine minder has some mechanical skill, acquired, however, only by fulfilling the duties of the office of an apprentice, and not by any special school training. His wages are higher than those of

Income.

11. Of Printers in London, by Dr. E. Smith.

Duties.

a compositor or pressman, averaging from 36*s.* to 50*s.* a week, and when he works for one night also he obtains a further sum of 9*s.* 6*d.*

His duty is to watch the action of the machine and the conduct of the machine boys, and hence does not involve much muscular exertion; but upon him, more than upon any other, devolves an amount of night work, often extending to two days and the intervening night. It is unnecessary to cite in detail the arrangement of his meals, &c., since they are practically the same as that of members of the other department working for similar periods. I have closely questioned many machine men as to the effect of prolonged labour upon them, and have always been informed that they become tired on the second day, and perhaps then take their food with diminished relish, but that they sleep soundly afterwards, and on the next day feel nearly well. They always state that any evil which they may experience is so little that it does not counterbalance the advantage of the money thus gained. There is a class of machine minders who work only in the night, and, as in the case of compositors, go round to the offices at night to ascertain if a night hand is required. They are commonly less effective and of less regular habits than the day men, but are engaged by those offices who do machine work largely, in order to save their regular hands.

Effect of prolonged labour.

Position and state of the machine room.

The machine room is necessarily in the basement, and more commonly perhaps below than on the level of the ground. Hence it will be placed underneath the other rooms, and be very imperfectly lit by side lights, or it will be built on a separate plot of land, as, for example, the yard, and have the advantage of skylights, admitting both air and light, or, as is perhaps the most common, it will occupy the basement floor of a building, and have a projection into the yard in which will be a skylight.

It thence follows that the sanitary conditions of machine rooms will vary extremely, and that whilst some will be light and may be well ventilated, others will be comparatively dark, and require the aid of gaslight both day and night, and offer the greatest obstacles to the admission of air. In one case I found a room still deeper in the ground, which, having windows, was said to supply air to the machine room, but on entering it I found it wet and dirty from the sinks at which the ink rollers are washed, and the whole place yielding a very offensive odour; a state of things very unfitted to supply air to a large building.

In several of the newer and larger offices I found excellent machine rooms in respect of size, light, means of ventilation, and the absence of excessive crowding; and in one I noticed a fan placed over the door, which was kept in rapid motion by the machinery, and only required the access of pure air to make it the most efficient ventilator which I had seen. Other machine rooms were a disgrace to the day, in size, position, darkness, overcrowding, and wretched ventilation. It must however be said of nearly all, that they become exceedingly hot at night when all the machines are at work and the gas lit; and although the overseer opens some of the windows under such circumstances, the heat still suffices to produce profuse perspiration, and particularly in summer or at any season when the weather is close. This will be also largely influenced by the position of the boilers, and as these are in nearly all the cases in the same or an adjoining room (the Times office is a marked exception), and not cut off from the machine rooms by thick walls, they do usually cause a large increase of heat and an emanation of fumes and steam which render the room still more unhealthy.

The machine minder is very generally thin and pale, and although professing to be in good health does not exhibit the evidences of it. At the same time he has good appetite and digestion, and exhibits a degree of strength abundantly sufficient for the requirements of his office.

Machine Boys.

Aspect of machine minders.

Two boys are always associated with the machine minder, to place and remove the sheets, and in newspaper work the number is increased. As a rule, in book work they have no one to relieve them; but in some cases a third boy is added, who relieves the other two at intervals, and allows them to rest. The value of this is very great in night work.

Machine boys.

Number to each machine.

These boys commence the occupation when 12 to 13 years of age, and receive about 5*s.* a week, and continue until about 16, when they obtain 6*s.* to 8*s.* a week, and if not required as apprentices they usually leave the trade to obtain more remunerative employment. Hence it is said that a large number of boys at that important period of life are thrown out of employment, and left to fall into crime. There are, however, some yet older, who continue, and are chiefly engaged on night work to relieve the younger boys.

Age and income.

Effect of labour on growth.

It was often pointed out to me that machine boys were short, and stunted in their growth, but that when another kind of occupation was found for them they grew rapidly. I therefore carefully noticed the boys in relation to their age and height, and put the question to the different overseers, and whilst I found very many small boys at 15 years of age, I found fairly tall ones at 13 or 14, and some tall ones at 16, and I did not find a very general concurrence of opinion in the remark which had been made to me. I do not know how to determine such a question with exactitude, and must admit that in reference to many persons who answered me their attention had not been before drawn to the fact; but I am inclined to think that the statement has a basis of truth.

It was accounted for by the fact that the boys were taken to work at the period when growth begins to proceed rapidly, and are placed and kept in conditions unfavourable both to growth and health, such as long standing, monotonous employment, long hours of labour, not an abundance of food, light, and air, and a restriction from play, and to one posture for many hours of the day. They almost invariably are very pale and thin, and many complain that they are weak. They are also the children of poor persons very generally, and do not have the advantage of a comfortable dinner at home, but with an allowance of 2*d.* purchase such a dinner as they can get, and eat it where they can find room.

Excessive labour.

Added to all this is the blight of their lives, excessively long hours of labour; labour even with young boys extending over two days and a night, and having intermission only whilst the "forms" are changed, or for irregular periods waiting for employment. The following is an example:—

Illustration.

A boy of 14 commenced work at 8 a.m., having taken breakfast of bread and butter and tea previously. At 11 o'clock he ate a little bread and butter; at 1 o'clock he dined by eating in the yard some cold meat and bread with water. At 5 p.m. he made tea, and took it with bread and butter. At 9 p.m. his supper consisted of bread and a little meat left from the dinner, but not enough to satisfy his hunger.

At 3½ a.m. he had ½ pint of tea with bread and butter. At the breakfast hour he went to a coffee shop, and paid 1½*d.* for 1 pint of coffee with which he ate bread and butter. He had not any lunch afterwards. For dinner at 1 p.m. he obtained 2*d.* worth of plum pudding, that sum being the amount given him by his parents with which to procure dinner. After this he would work until 8 p.m. The quantity of bread and butter eaten at each meal could not have been large, for the whole quantity for all the meals was brought from home by him on the morning of the first day. He acknowledged that he had had an insufficient supper, and had no bread and butter for lunch the next day, and hence could not have had any for tea on the second day. Moreover, his dinner was most meagre, and with the money allowed him he could not have bought meat. Hence it must follow that he was very insufficiently fed; and yet upon that food he had to work (with certain intervals) two days and one night.

He stood at the machine and moved his arms from 8 a.m. to 1 p,m., from 2 p.m. to 5 p.m., and then from 5½ to 10 p.m., when he rested until 11 p.m. Then from 11 p.m. to 12½ a.m., when he rested until 6 a.m., then from 6½ a.m. to 7½ a.m., from 8½ a.m. to mid-day, from 2 p.m. to 5 p.m, and finally from 5½ p.m. to 8 p.m., making a period of 25 hours in which he stood and worked. There was no place to lie down upon comfortably, and when he was laid down in the night he was too tired, and the noise of the machinery too great, to permit him to sleep, except for about 1½ hour. The interval on other nights was usually less than on this occasion, and depended upon the number of sheets which they had to print from one form. He was pale, and looked jaded. His arms had ached, and he had felt very tired all the day. His feet were sore and swollen from the long standing during the night. He felt cold part of the night. After such prolonged labour, he obtained one night's rest, and suffered from headache on the next day. Such is a common case, and is it not one of great cruelty on the part of both parents and employers? It is acknowledged by the employers, that the machine boys are the greatest sufferers in the establishment, and surely their condition only needs to be made known to obtain a suitable amelioration.

Warehousemen and boys.

Warehousemen and Boys.

I do not purpose to refer to the conditions of this class, since they are those of porters in general. The men engaged in wetting paper are said to suffer from rheumatism, but in very large newspaper offices, as the Times office, this process is now carried on by machinery. Those employed in the drying-room are generally exposed to a considerable degree of heat, but the greatest degree of heat, viz. 90° to 120°, occurs when they are absent, and I did not find any ill-effects produced, except liability to take cold, and perhaps a diminution of the appetite. Moreover, only one or a very few persons are occupied in either of these processes in an ordinary establishment.

I must, however, remark, that warehousemen are allowed to enter the sick clubs of the establishments, and hence probably give a somewhat better aspect to the rate of sickness and mortality than would have occurred with compositors alone.

Lithographic Printers.

I have visited several of these establishments, and have inquired into the sanitary condition of two classes of operatives, the draughtsman and the pressman, as well as into that of the boys working with the pressman when dusting colours.

The conditions of the draughtsman are superior to those of the letter-press compositor, although he sits at his employment, and is generally pale and thin; whilst those of the pressmen are nearly identical with those of letter-press printers.

The only subject on which I think it necessary to dwell is that of the dusting of colours.

Dusting colours.

In this occupation the paper is first printed in the press, and then, while the ink or colour is wet, is handed to a boy, who, by means of a duster properly folded up, or by a brush, rubs or sprinkles the dry colour upon it until the ink is rendered dry. In effecting this the particles of dry colour escape into the air, and are inhaled by the boy, and even by the pressman who stands by his side; but when the colour is known to be very injurious the mouth and nose are covered by a cloth, or the work is done in a case with a glass front, through which the boy may observe the effect of his labour. Both expedients are, however, disagreeable, and are not resorted to unless it is felt to be necessary.

Effect on the health.

All the mineral colours are said to excite an injurious influence, but undoubtedly the most pernicious are, 1st, emerald green, and, 2nd, bronze.

With emerald green there is irritation produced about the nostrils, and the mouth becomes a little dry on the first day, but on the second day the nose and mouth become inflamed, and there is much sneezing, with discharge from the nose, followed by ulceration and bleeding. On that day or the following an eruption begins to appear around the mouth and nostrils; the eyes are sometimes inflamed; the throat is very dry and sore, and cough occurs. Up to this period the condition appears to be purely local; but if the exposure be continued a sense of nausea and illness comes on, which is both felt by the boy and seen to exist by his aspect. At this point the boy is sent home, and another one takes his place, and in a few days all the symptoms have passed away, except perhaps cracks in the lips or sores in the nostrils. It is not usual to keep a boy at this occupation for more than two or three days, and I did not anywhere meet with a boy who had dusted this colour for the space of a week.

No further ill-effects seemed to follow in any case, and no important disturbance of the general system occurred at the time, or followed the cessation of the occupation.

Bronzes (containing copper) caused irritation in the nose and mouth, but in a less degree than emerald green, and did not render the boy ill.

Silver colour simply caused head ache, and did not produce local soreness.

General conclusions.

The following are the conclusions which I draw from this inquiry:

1. There is no branch of the printing trade in which the operatives as a class exhibit the evidence of robust health.
2. The readers and the compositors are the furthest removed from good health, whilst pressmen and machine men occupy the next place.
3. The condition of the boys, and particularly of those attending the machines, demands instant amelioration.

4. There is some diversity in the aspect of the operatives, and this is due to one or more of three causes, viz., to differences in their original constitution, to the special circumstances of the different offices, and to the propriety of their own conduct. The diseases with which they are afflicted will also be modified both in nature and type, as these special circumstances prevail in any individual.
5. The general character of the diseases is that of exhaustion, due chiefly to defective alimentation and assimilation, or defective appetite and digestion; lassitude, defective strength, feeble heart's action, and lessened respiration, associated with a tendency to head-ache, bilious derangements, swelling of the feet, and piles.
6. The special diseases are, affections of the brain, rheumatism, gout, rheumatic gout, and affections of the eyes.
7. There is a remarkable freedom from acute diseases, except such as are associated with ordinary colds.
8. The mortal disease of printers is consumption,—the goal to which the long-continued low state of general health tends—which is nearly twice as prevalent among them as among the members of the whole community. Associated with this are other diseases of the heart and lungs, and in this combined form "chest diseases" are also twice as numerous as among an equal-number of persons in the general community.
9. The diseases of printers are commonly ascribed more to their unsteady habits than to the conditions of their occupation; but whilst it may readily be admitted that excess will predispose the system to the attacks of disease, the nature of the diseases, as above mentioned, show that they are less due to the habits of the operatives than to the conditions of their labour.
10. It is very remarkable how little specific ailment is felt by printers (considering their general aspect and the mortality); but that is no sufficient test of health, for they lack the means of comparison in the degrees of health, and the absence of suffering misleads their judgment.
11. It is of the highest value that so many printers live at a distance from their office, and often in the suburbs of London, since during nearly half of the 24 hours they thus live in improved sanitary conditions, and mitigate the evils of their occupation.
12. It cannot be doubted that the defective condition of the system in printers is due to preventible causes, and that the excessive amount of consumption ought to disappear.
13. The evil conditions are universally ascribed by the men themselves to the right causes, viz., defective ventilation and over-work, whilst they as generally affirm that there is nothing in the *necessary* conditions of their occupation beyond those of any other in-door trade which should tend to disease. Night-work alone does not appear to be more injurious than day-work alone.
14. As to ventilation, the following are the great evils:—
    (A.)—The combustion of gas of an inferior kind, so that the sulphureous compounds thus produced render the air to be respired highly impure, and injurious to the lungs. This is an evil of so great a magnitude, and affecting now the interest of the whole community, that it demands the

earnest attention of the government. Whatever may be the difficulties of the case, it is well known that to produce gas at a low price inferior coal is used, and the purification of the gas effected in the least expensive manner. The present standard of light and purity is much too low for the health and comfort of the community, and is such that with the ordinarily good ventilation of a private house the products of the combustion of gas are very offensive, and certainly tend to induce bronchitis, and one form of asthma. How much more injurious will it be when 150 gaslights are burning in one room, with the inferior system of ventilation which is found in workshops! It is the universal belief of the operatives that this is one of the chief causes of their injury.

General conclusions.

B.—With the present state of ventilation, the space allotted to the compositor is too little for the requirements of health. 600 cubic feet is about the maximum space found in any book establishment, whilst in many 450 cubic feet only is allowed. This is required to support the combustion of one gaslight and the respiration of a man.

C.—The means of interchange of air are exceedingly defective, so that the evils of the above-mentioned restriction on space are greatly increased. In almost all offices the ventilation is effected chiefly by the window, but it defeats its object, since so large a volume of cold air as is admitted by an open window placed within five feet of the operator cannot be borne in the winter season, and particularly when the direction of the wind corresponds with the opening.

The other plans adopted are in many cases of great value, but whilst they may suffice to maintain a moderate circulation of air during daylight, they are utterly powerless after the gas has been lit.

D.—The accumulation of heat greatly depresses the vital powers, as well as renders the skin very sensitive to the influence of lower temperature. This can be prevented only by a more free admission of the cooler air, and a free exit of the heated air.

15. By way of remedy I suggest the following considerations:—

A.—The removal of all offices from old houses to buildings specially erected for printing offices, with a due regard to site, surrounding air, cubic space, and ventilation.

B.—The proper cleansing of the basement, passages, and staircases daily, and that not merely to prevent accumulation of masses of rubbish and dirt, but to remove the matter which attaches to the boards and bricks. This can only be done by washing as at private houses.

C.—Lime washing all the rooms twice in a year, and painting of the room every two or three years, to remove the blackened state of the walls, to improve the light, and to give a fresher odour in the room. I was informed that although this is almost entirely neglected it is perfectly practicable.

D.—A proper supply of fresh air to the basement by means of an open yard, which should be kept well paved and clean.

E.—The proper location of the urinals and water-closets apart from the workrooms, with the application of a shaft to carry off the effluvia, and with proper and efficient cleansing daily. The prevention of any such matters passing down the rain-water pipes or into untrapped pipes and sewers.

F.—Limitation in the size of the sinks now used for the washing of the rollers, and the proper application of iron gratings to cover the floor, laid at an angle to carry off all the impure water into trapped sewers. The removal of these from the workrooms and adjoining rooms into an open yard.

G.—A system of ventilation quite apart from the side windows, by which the air shall be admitted in small volumes, but at many parts of the room, at a considerable distance from the operatives. In the rooms open to the roof this could be effected by the tubes in the ridge of the roof, and by air chambers covered with perforated zinc all round the base of the skylights, and descending by perforated tubes into the room at various points. In the middle rooms an air beam should be carried across the room, open to the external air at both ends, and having perforated plates in its sides. Or the ordinary air gratings or air bricks, with a cover so arranged that the current shall be carried (not simply directed) to the middle part of the room on a level with the ceiling, and if necessary this cover may be perforated with holes after the manner of the beam.

H.—To ascertain by experiment what number of such ventilators are necessary in each room, in the conditions of daylight and gaslight, to maintain a temperature not below 52° and not above 66° in the winter half of the year, and yet not allow of a direct draught upon any workman. The rope by which these degrees of ventilation would be effected under the different conditions should be in charge of the overseer only, and be locked up, so that the workman could not alter it.

I.—The workman should be required to work in a coat and cap.

K.—The artificial heating of the room should be properly regulated, and the pipes placed in the middle portion of the room, and open fire-places permitted when practicable.

L.—The openings in the roof should always be defended by tubes of several feet in length, and having a lobster cowl on the top end, and a perforated plate on the lower end.

M.—The free opening of the doors, windows, and ventilators should be insisted upon at the meal hours, and the air should be fresh each morning.

N.—It would be highly desirable that an inspector should be appointed by the government, with authority to aid the employer with his advice, to inspect the condi-

tion of the premises, and to report to the Government from time to time until the general condition of these establishments should be favourable to the health of the operatives.

16. It is most important that the present system of over-work and night-work should be authoritatively revised, with a view either to its abolition or to a proper relay of operatives to effect it, so that none should be required to labour beyond the ordinary hours. No man, and particularly no boy, should be allowed to work both night and day, even for one such period at a time, but two persons should do the work. This broad distinction might, I am convinced, be effected; but to prevent an extension of day work until a later hour than is usual, or to 10 p.m., may often be very difficult.

General conclusions.

17. Boys below 21 years of age should not be employed longer than the ordinary hours of labour, and none of less age than 20 years should be engaged in night work.

18. The system of out-door apprenticeship, and the delegation of the intelligent supervision of the youths by the master printer to another authority, is attended with much evil. The sum allowed to the boys in the early part of their apprenticeship is too little for their support, and hence there is a particular reason why the master should fulfil the condition of the indenture, and *know* that the boy is supplied with abundant food. As the present system is in direct evasion of the conditions of the indenture, some superior authority should be exercised to ascertain its effect upon the apprentices.

19. The amount of sickness and mortality among apprentices is apparently small during their period of apprenticeship, but these do not measure the state of the constitution.

20. It is very desirable that some uniform system of registration of disease and mortality throughout the whole trade should be effected and maintained. A system could be devised which would obviate the known sources of fallacy.

21. It is most important that the employer should provide accommodation for the convenience of the operatives in taking their food. A separate room should be set apart for this purpose, in a position where the air would be pure, and where the establishments are large there would be no difficulty in forming a combination to provide suitable food at cost price, the employer providing the capital to give it existence. A co-operative society is established in one large office, and the extension of the system to other offices would benefit the operatives. The absence of milk is a striking defect in the usual dietary.

22. The "Times" office is a striking example of the possibility of effecting almost all the conditions now referred to, when a liberal hand, an intelligent head, and a firm will are engaged; but it is a singular corollary to these improvements, that the ratio of sickness has rather increased since they were effected.

SUPPLEMENT to REPORT on Sanitary State of Printers.

Analyses of the air in printing offices.

General conclusions.

Conditions of the inquiry.

The following are the conditions under which the analyses have been made :—

1. Where day and night work are performed in the same office an experiment was usually made under both conditions, so far as that the day inquiries were prosecuted in the afternoon, and the night inquiries from 9 or 10 p.m. to 1 or 3 a.m. In some instances the intermediate period of from 5 to 8½ p.m. was taken, and denominated evening.

2. The elevation from the floor at which the air was drawn into the apparatus was usually four feet, so as to test the condition of the stratum of air which was respired by the operatives, but in a few experiments, as Nos. 6, 12, and 13, the elevation was about two feet only.

3. The various states of the atmosphere in the different parts of the offices rendered it needful to select the rooms in which the experiments should be made upon some principle. With one exception, and that No. 12, the composing rooms were chosen; and when there were intermediate and upper rooms I selected the former, with a view to ascertain the maximum state of impurity, except in No. 11, where an upper and well-ventilated room, in a not very good office, was chosen by way of contrast. Several offices had but one composing room, and it was open to the roof.

It is also needful to premise, that variations in the state of the atmosphere occurred at different hours of the day, as the operatives were present or absent, and were engaged at their frames, or were moving about; also as the windows were partially opened or closed.

Method of inquiry.

The apparatus employed was a series of U tubes, so arranged as to collect the vapour by means of chloride of calcium and sulphuric acid, to collect the carbonic acid by a strong solution of caustic potash, moistening pumice stone, and to arrest the vapour which was carried off from the solution of potash by chloride of calcium and sulphuric acid. The aspirator was a two-feet air-holder, with a register in cubic inches, or a one foot holder, with my spirometer attached, which registered to 1 cubic inch, their ordinary mode of action being inverted, and directed to draw a current of air through the tubes. The quantity of air which was usually passed through in each experiment was 10,000 cubic inches, and the time occupied in its passage was about four hours.

The estimation of the animal matter contained in the air was made by the permanganate of potash in the manner devised by Dr. Angus Smith, F.R.S. The solution had a strength of $\frac{1}{1000}$, and 109 grains were employed in each experiment. The air was frequently well shaken with the solution, and each bottle full was used for half an hour or one hour. When 24 hours were consumed in the inquiry without the fluid having been decolorized the animal matter was regarded as a trace only.

The following are the results obtained in 13 analyses :—

Number of Analysis.	Number of Office.	Experiment made at Day, Evening, or Night.	Vapour: In 1,000 Cubic Inches.	Vapour: In 1 Cubic Foot.	Vapour: Inspired per Day of 12 Hours at the Rate of 500 Cubic Inches of Air per Minute.	Carbonic Acid: In 1,000 Cubic Inches.	Carbonic Acid: In 1 Cubic Foot.	Carbonic Acid: Inspired per Day of 12 Hours at the Rate of 500 Cubic Inches of Air per Minute.	Animal Matter. Number of Cubic Inches of Air required to decolorize 100 Grains of the Solution of the Part of Permanganate of Potash and Water.
			Grs.	Grs.	Grs.	Grs.	Grs.	Grs.	
1	1	Day to 6¾ p.m.	1·2	2·07	432	0·84	1·45	302	..
2	"	Ditto							
3	"	Night to 1 a.m.	1·48	2·55	532	0·502	·86	180	..
4	2	Day	1·46	2·51	525	0·44	·76	158	..
5	"	Night to 12 p.m.	2·41	4·15	767	0·97	1·67	349	580
6	3	Evening to 8 p.m.	2·0	3·45	720	2·94	5·	1,058	..
7	"	Night to 12½ a.m.	2·41	4·15	767	·6	1·03	216	870
8	4	Day to 3 p.m.	1·59	2·74	572	·48	·82	172	..
9	"	Night	2·06	3·55	741	1·0	1·7	360	..
10	5	Evening to 8 p.m.	1·92	3·31	691	·56	·96	201	484
11	6	Night to 1 a.m.	1·09	1·88	392	·3	·51	108	436
12	7	Evening to 9 p.m.	3·3	5·69	1,188	·8	1·38	288	620
13	"	Ditto	·8	1·38	288	·8	1·38	288	700

These analyses show—

1. That the weight of vapour in one cubic foot of air varies from 5·69 grains in a machine room, and 4·15 grains in a composing room, during the evening and night, to 1·2 grains in a composing room during the day. The average in the day was 2·44 grains, and in the night 3·3 grains. The quantity inhaled by a workman in the course of 12 hours varied from ·66 oz. to 2·7 oz.

2. The weight of carbonic acid in one cubic foot of air varied from ·51 grains to 5 grains, and in the offices in which day and night experiments were made consecutively the quantity in the latter was usually twice of that in the former. Accepting Dr. Angus Smith's analyses of the air in Manchester as applicable to the air in Lond[illegible] selecting from the above table analyses Nos. 4. and 5. and Nos. 8. and 9. as average examples, the quantity of carbon[illegible] the air of printing offices was twice as much in the day and [illegible] as much in the night as in the open air. The quant[illegible] which would be inspired in the course of 12 hours varied from [illegible]4 oz. to 2·42 oz., both quantities sufficiently great to interfere with vital changes by its action as a poison, and by [illegible] the interchange of gases in the lungs, and in any physi[illegible] as to the quantity of carbonic acid inhaled would [illegible] attention.

3. The quantity of animal [illegible] contained in the atmosphere was much more than is found in [illegible] air, and usually more than that existing in the air of private dwellings. From an experiment in the open air which was continued during six days I found that 109 grains of the test solution was decolorized by 4840 cubic inches of air, and from another made in a not very well ventilated private dwelling the quantity required was about 1000 cubic inches. The average [illegible] inquiry in printing offices gave 615 cubic inches as the [illegible] required for that purpose, and proved that the quantity of [illegible] matter there existing was about eight times greater than that found in the open air. It appears also that the greatest quantity observed closely corresponds with that found by Dr. Angus Smith in the air of middens in Manchester, in which the cesspool was covered over with ashes, and the whole was in a quiescent state.

No. 12.—REPORT by DR. EDWARD SMITH on the SANITARY CIRCUMSTANCES of TAILORS in LONDON.

12. Of Tailors in London, by Dr. E. Smith.

The circumstances in the tailoring trade which affect the sanitary condition of the operatives are exceedingly varied, and demand a short preliminary statement.

Circumstances of the trade.

About one-fifth of the male operatives in London work in shops apart from their own dwellings, whilst the remainder work in their own rooms. I have considered the inquiry as especially referring to men, but as the larger proportion of the inferior work is performed by women alone, and as work of whatever kind when done at home is partly done by women, I have thought it necessary to extend the inquiries to both sexes.

Where employed.

Both sexes.

Division of work.

The work itself is divided into several classes or branches, well recognized and distinctly named in the trade. Such are, 1. Bespoke work, such as is required by private tailors universally; 2. Ready-made work, which, inferior in quality and price to the former, is often only a higher class of, 3. Slop work; and 4. Government work, which includes the clothing of the army, navy, volunteers, police, post office men, &c. The remuneration for work done diminishes from the first to the last; but that of the first is vastly greater than that of the second, whilst that of the third and fourth are nearly equal. The best tailors make the first class of work, and are almost exclusively men; and whilst all the other classes of work must be well done, inferior workmen or workwomen may do it, according to their aptitude for work and the value of the material.

Where performed.

The best work is chiefly performed in shops, whilst the inferior is done at home, but is only obtained by such persons as can give security to or leave a deposit at the shop or warehouse to the value of the material entrusted to them, or who are well known to the employer. The introduction of the sewing machine into the best shops has scarcely taken place, but houses doing slop or government work usually have a number of machines at work on the premises, which sew the long seams, and the goods thus partly made are given to the out-door tailors to be finished.

Classes of tailors.

The master tailor.

The middleman.

There are three distinct classes of tailors, viz., the master tailor, the middle man, and the operatives. The master tailor is in direct association with the purchaser, and may do his own work exclusively, or employ any number of workmen or workwomen. In a majority of cases in private trade he is practically acquainted with the trade; but in others, and particularly in the large warehouses, the foreman is the practical man, and the intermediary between the operative and the master tailor. The middleman receives a distinct appellation, according to the kind of work in which he is engaged. In private trade, a person obtaining work from a shop, and doing it at his house, is called a "sweater," whether he do it alone or employ others to help him; but the term was manifestly intended to apply to those who employed others to do the work, and made a profit by their labour.

When the middleman is engaged in government work he is called a "sanker," and the work is "sank" work; and it not unfrequently happens that he employs another middleman, and this one a third, all of whom receive a profit between the sum paid to the operative and that given by the contractor with the government. When the government supply the work directly, as at the Royal Army Clothing Depôt at Pimlico, they nominally decline to deal with sankers, and employ only the individual operatives, or the head and members of a family;

but in my inquiries I found many sankers who obtained it, and let it out to others at a profit. In the case of slop work obtained from warehouses, the middleman is called a middleman or bagman, and some of these employ many persons as in-door or out-door operatives, or "machine" the work in their own shops, and have it finished by out-door operatives. In some instances the middleman works at the needle himself, but more usually he lives on the profits made by the operatives whom he employs. This class of persons are not numerous at the West End, and may be sought for about the Seven Dials; but in the East End they are exceedingly numerous, and as by their aid the warehouseman can do a large business, with less labour and risk than by having in every case direct dealings with the operatives, they are encouraged.

The operatives themselves are cutters out or makers; the latter usually divided into coat hands, waistcoat hands, and trowser hands; and when sewing machines are employed there are machine hands and finishers. Some operatives do every kind of work. A few have one or more sewing machines, and they are both "machiners" and "finishers;" but the great majority work only with the needle in making the whole garment, or in finishing it after it has been machined. The operatives.

There are no apprentices in the chief London shops, since the masters do not think it profitable to teach them. But many persons who have fulfilled their term of apprenticeship in the country come to London, and find employment in the shops, either permanently or whilst improving. Persons working at home take apprentices; but such are for the most part their own sons. Apprentices.

There is no system of apprenticeship among the female tailors; but a person desiring to learn the sewing part gives three months' labour, without wages, and then is paid according to her ability. A machinist pays 1*l.* or 2*l.* for a month's teaching, and works during that period without wages, or in large establishments no premium is paid, and she receives a low rate of wages, almost immediately, or after an interval of three to six months. Teaching of females.

In pursuing my inquiries I have included the master tailor, when he worked with the needle, and also the operatives, both male and female; but I have excluded cutters and foremen, since their occupation has really no analogy in a sanitary point of view with that of the working operative. I have visited a large portion of the shops at the west end of London, where some thousands of operatives are engaged; all the warehouses at the east end, where machine work is carried on; the Army Clothing Depôt at Pimlico, where garments are both machined and finished. In reference to those working at their own homes, I have visited many living to the east of Regent Street, in the West End, where the best and middle kinds of work are done, also those living about the Seven Dials, who do government work through the middle men, and numerous families and persons residing in Whitechapel who do slop and sank work. I have also met with many suitable cases among the out-door operatives when attending at the warehouses to bring in and take out work. Selection of classes, and places for the inquiry.

I have universally obtained ready admission to shops and private houses, and many of the proprietors of the large wholesale warehouses have shown every courtesy; while of others I am constrained to state that the information was given with great reluctance, and others still did not respond to my letters requesting permission to prosecute my inquiries in their establishments, and thus tacitly refused information.

As to those working in shops the inquiry specially included the state of the ventilation, and the crowding of the shops, with the effect upon of the inquiry. health, as evident to myself, as reported by themselves, and as shown by the number of weeks sickness per year; whilst of those working at Special objects

home the inquiry specially referred to long hours of labour, and the means of living, as well as the general sanitary state of the apartments, and the general evidences of health; these being the distinguishing features of the two classes of operatives.

12. Of Tailors in London, by Dr. E. Smith.

I shall first record the results of the inquiry at the shops, and then at private dwellings.

1. OPERATIVES IN WORKSHOPS.

OPERATIVES IN SHOPS.

Mode of working.

It is the universal habit for the tailors to sit on the floor, so that if the room be lofty it seems almost empty, whilst at the same time the floor is fully occupied by men. They retain their usual places, and when they have the opportunity to select for themselves, prefer that part where the light is good, and where there are not any draughts, and do not seek those where the ventilation is the best. Most frequently they sit with the legs crossed, and for relief only, stretch out one or other leg, or even draw up one leg, and place their work upon the knee for short periods. The back for the most part bends as a whole, moving from the hip joint, as from a hinge placed at the bottom of the back, so that while the trunk leans forward somewhat, the straight line of the back is but little broken. In a few cases, and particularly in the younger men, the shoulders are drawn towards each other and the chest is contracted, but usually the full width of the chest is maintained. Moreover, the work being held firmly by the left hand, and the right arm thrown out in the act of sewing, they somewhat tend to prevent anterior contraction of the chest. Hence I have been surprised to find so few instances of roundness of the shoulders, and to observe how universal an erect figure is in this class of persons.

Deficient respiration.

The sitting posture is, however, retained so constantly, and for so long a period each day, that the movement of the lungs, and the amount of air inspired, is reduced almost to a minimum. In a long series of experiments which I have made with a view to determine the effect of posture and exertion over the quantity of air inspired in any period, and consequently over the movements of the chest, it was shown that only in the lying posture was it less than in the sitting posture; and that the difference between the amount in the latter and that when walking at the moderate rate of three miles per hour was no less than three times of that in the sitting posture. The following table gives the result of this series in many modes of exertion, all compared with the amount of the respiration in the lying posture as the standard.

Experiments on respiration.

The effect in the lying posture being	1·
That of the sitting posture is	1·18
Reading aloud and singing, each	1·26
The standing posture	1·33
Railway travelling in the 1st Class	1·40
" " 2d Class	1·5
" " upon the engine at 20 to 30 miles per hour	1·52
" " upon the engine at 50 to 60 miles per hour	1·55
" " in the 3d Class	1·58
" " upon the engine (average of all speeds)	1·58
" " upon the engine at 40 to 50 miles	1·61
" " upon the engine at 30 to 40 miles	1·64
Walking in the sea	1·65
" on land at 1 mile per hour	1·9

All the above have an influence exceeding but not the double of that of the lying posture.

Riding on horseback at the walking pace -	2·2
Walking at two miles per hour - - -	2·76

These have been two and three times the influence of the lying posture.

Riding on horseback at the cantering pace -	3·16
Walking at three miles per hour - -	3·0
" " - - - -	3·22
Rowing - - - - -	3·33
Descending steps at 640 yards per hour -	3·43
Walking at three miles per hour, and carrying 34 lbs. - - - - - -	3·5
Walking at three miles per hour, and carrying 62 lbs. - - - - -	3·84

These have an influence from three to four times greater than that of the lying posture.

Riding on horseback at the trotting pace -	4·05
Swimming - - - - -	4·33
Ascending steps at 640 yards per hour - -	4·4
Walking at three miles per hour, and carrying 118 lbs. - - - - -	4·75
Walking at four miles per hour - - -	5·0

These have an influence from four to five times that of the lying posture.

Lastly. The tread wheel - - - -	5·5
Running at six miles per hour - -	7·0

Quantity of air respired in sedentary and active conditions.

The usual hours of shop-work are from 6 and 8½ a.m. (according to the amount of work to be done) to 7 and 8½ p.m., and hence when fully occupied not less than 12 hours are spent in the sitting posture. During this period about 324,000 cubic inches (188 cubic feet) of air would be respired; but if the operative had laboured out of doors with the mixed labour of standing and walking during 10 hours of the period the quantity would have been no less than 714,000 cubic inches (414 cubic feet), or considerably more than twice the former quantity. As the quantity of air which is respired represents the amount of change proceeding in the body, and as the degree of expansion of the lungs and the chest movements have an important reference to the occurrence of consumption, it is manifest that the occupation of tailors is very unfavourable to health.

Sanitary state of shops.

Shops vary much in their sanitary conditions, but almost universally are over crowded and ill ventilated, and in a high degree unfavourable to health. Some are found underground, either in the basement of a house, or built like a large kennel in a small enclosed yard, and are such as no domestic servant would inhabit. A very few have been built as workshops for this or some other occupation, and have large rooms, with an abundance of windows. Some consist of a whole house, with the walls on each floor removed, a well staircase occupying the centre, and skylights placed in the roof of the upper room. Others are simply rooms on the upper floors of the premises, and others, still, are single rooms, built in the rear of the premises, and lighted and ventilated from the roof only.

Modes of ventilation.

In exceedingly few shops have there been any attempts at ventilation, except through the windows placed at the sides or in the roof;

but in some, air-bricks have been inserted into the wall, or a tube, with perforated zinc placed in its upper edge, and communicating by the end with the outer air, passes through the room, or tubes of various kinds pass perpendicularly from the floor to the roof. The ventilation through the windows is practically inefficient, since when it occurs only through a moderate opening in the skylights, and the doors are kept shut, the interchange of air is but small, and when through a large opening in the skylight, or through side windows placed near the operatives, the draught cannot be borne, and some of the operatives insist upon them being kept shut. Such rooms are necessarily warm; but when the gas is lit, as during the day time in foggy days, and at night during the winter, the heat increases to 80° and even to upwards of 90°, causing profuse perspiration, and condensation of vapour upon the panes of glass, so that it runs down in streams or drops from the roof, and the operatives are compelled to keep some windows open, at whatever risk to themselves of taking cold.

Overcrowding.

In reference to overcrowding, I have recorded in the following table the measurements, taken approximatively, of some of the most important west-end shops, and the number of men and gaslights found there; but it must be remarked that in the busy period of the year, viz., the summer time, a much larger number of men occupy the rooms than at other periods, and the gas is either not lit at all or only for a short time.

Cubic space allowed.

Shop No.		Cubic feet per man on the greatest fulness.
1	30 ft. × 33 ft. × 15 ft. for 92 to 100 men (22 in a gallery)	148
2	21 ft. × 24 ft. × 7¾ ft. for 21 men	188
3	48 ft. × 18 ft. for 24 to 36 men	240
4	48 ft. × 16 ft. × 10 ft. for 35 to 40 men, and 15 burners	192
5	27 ft. × 27 ft. × 10 ft. for 40 men and 15 burners	180
6	45 ft. × 20 ft. × 10 ft. × 3 ft. for 100 or more	270
7	20 ft. × 38 ft. × 7½ ft. for 30 to 34 men, and 19 burners	160
8	12 ft. × 7½ ft. × 10 ft. for 8 men	112
9	13 ft. × 13 ft. × 10 ft. } 32 men, and 10	105
10	12 ft. × 7½ ft. × 10 ft. } burners	
11	24 ft. × 9 ft. × 10 ft. } 21 men, and 12	154
12	9 ft. × 12 ft. × 10 ft. } burners	
13	28 ft. × 4½ ft. × 7½ ft. for 13 men } These in	230
14	48 ft. × 12 ft. × 8⅝ ft. for 27 men } one room	
15	24 ft. × 12 ft. × 8 ft. for 16 men, and 8 burners	144
16	7 ft. × 12 ft. × 8 ft. for 6 men	112

The amount of overcrowding will be properly estimated when it is known that the largest cubic space in these ill-ventilated rooms allowed to each operative and the gaslight is 270 feet, and the least 105 feet, and in the whole average only 156 feet per man. In one room, with a gallery running round it, and lighted only from the roof, from 92 to upwards of 100 men are employed, where a large number of gaslights burn, and where the urinals are in the closest proximity; the cubic space does not exceed 150 feet per man. In another room, which can only

be called a kennel in a yard, lighted from the roof, and ventilated by a small skylight opening, five to six men work in a space of 112 cubic feet per man. Such a state is, so far as my inquiries have yet extended, without parallel in workshops in other trades. As it exists in some of the best houses, men of good moral conduct and character must be found there; but my observation has led me to the belief that in the worst ventilated shops the men employed are of inferior moral character, and that the steady and respectable men avoid them.

Improvement of the character of operatives.

It was almost universally allowed that the operatives have greatly improved in moral character, conduct, intelligence, and domestic comfort within the last 10 or 15 years, and that a less amount of intoxicating drinks, and particularly of ardent spirits, is now taken. Formerly the operatives very generally brought the gin bottle to the workshop, but such is no longer the case; yet in a few shops I heard that the publican's man brought spirits into the shop at 7 to 8 a.m., and that some, and chiefly the older men, still take their morning dram. It was also admitted that a certain and perhaps not inconsiderable number took spirits in the evening after they had left the shop. The quantity of beer which was drunk varied much in the different shops, with different men, and with the income of the period of the year. I found a few teetotallers, and some who drank only half pint and one pint per day; and, on the other hand, some who scored 105 half pints during the working hours per week; but the usual rule is to take half a pint at lunch, dinner, and at six o'clock in the shop, and one pint at supper, and on the average the daily quantity was believed to be two pints and upwards, and probably a mean of about three pints per day. The quantity was increased during the heat of summer, and in the long winter nights when the gas heated the rooms. Hence, with every allowance for the improvement in the habits of tailors, it must be admitted that many drink to great excess; that a noticeable proportion still indulge in ardent spirits; and that the average quantity of intoxicating drinks far exceeds that of out-door labourers in general. There was a general belief that such conditions of the trade, as want of exercise, deficient ventilation, excess of heat, and monotony of employment, led to drinking, and that the uncertainty in the amount of employment, embracing anxiety to complete work urgently required, and, probably, absence of employment, led to reckless habits and excess. I questioned several teetotallers as to the effect of the former in inducing them to drink largely of tea or other non-intoxicating fluids, and generally they replied that it did not increase their desire for fluid. I also, on many occasions, sought the opinion of those who drank much beer as to its capability for work and the state of the health of the teetotallers, and it was universally admitted that the latter did their work as freely, quickly, and as well as themselves, and that their health was at least equally good.

Drinking intoxicating liquors:

Causes of

In nearly every shop there was some difference of opinion as to the healthfulness of the occupation, each person being doubtless influenced by his own personal experience, and many inferring that the health of the tailor must be bad because the conditions in which they were placed were unfavourable to health; but by far the greater number of men, and in some cases whole shops, concurred in the belief that the trade was not only as unhealthy as other in-door occupations, but more unhealthy than others, except perhaps those of shoemakers and basket-makers. It was singular to observe how uniformly this was attributed to the condition of the workshop; so that, except in perhaps two shops, they thought that their health was better than that of tailors in certain other shops with which they were acquainted. Defi-

Opinion of the operatives as to the healthfulness of the trade, and causes of disease.

12. Of Tailors in London, by Dr. E. Smith.

cient ventilation, heat, and draughts were the causes of diseases to which reference was universally made.

It was not infrequently affirmed that the dust from the cloth, and the emanations from the burnt cloth, whilst being pressed, were injurious to health; and it must be admitted that the heat from the large hot irons, and from the stoves at which the irons are heated add to other evils.

Aspect of tailors.

The operatives are for the most part pale and thin, whilst some have an ordinary amount of flesh and others are of full habit; the latter it is believed due largely to the use of beer. I have ascertained their ages in many West End shops, and although in most shops one or more elderly men were found, no less than 70 per cent. of the whole are under 35 years of age. This marked absence of old men, except in one or two old established shops, would lead to the inference that the operatives die at an early age (and such indeed was the opinion of many);

But few old men in shops.

Reason for.

but there are other reasons for it. Thus, between 40 and 50 years of age, failure of eye-sight, not from short sight, long sight, or cataract, is very common, the style of their work is then less modern, the rapidity with which the work is done is then lessened, and generally the workman is less valued by the master. Moreover, as the tailors work in "squads" of two or usually of three, the elderly man cannot, in press of business, do an equal amount of work with the younger; and although the workmen are forbearing to each other, a period arrives when they complain, or when a master or foreman perceives that the elderly man either impedes the work, or, as all three operatives work on the same coat, renders the quality of the work unequal. Hence, as a rule, masters and foremen object to employ a man who, at middle life, is compelled to begin the use of spectacles, and he ceases to be found in shops. Co-existent with these is a reason on the part of the elderly operative. As his family grows up they require employment, and if he obtain work from the shop to be done at home he can keep both himself and his family employed, and the total income of the family is thus increased. Hence there are so many reasons why elderly men should be few in shops that we are not at liberty to infer from it that the operatives die at an early age.

Night-work.

Night-work does not exist in any London shops, even in times of the greatest pressure of business; but on some occasions the hours are prolonged to 9 or 10 o'clock, and as the work begins at 6 or 6½ a.m., at that period 15 to 16 hours are spent in labour. To the absence of night-work, and the rare occurrence of prolonged hours of labour, must be attributed the fact that the operatives can live at all under the conditions in which they are found.

Amount of food.

The amount of food which is obtained differs somewhat, and sometimes greatly, with the variation in the amount of labour at the different seasons of the year. When in moderate and full work, animal food of some kind is eaten thrice a day, at breakfast, dinner, and supper; the two former almost universally, and the latter generally; and although the appetite is somewhat dainty, and refuses much bread or rough food, it enables them to take a tolerable quantity of meat and such relishing food as they prefer. As a whole, it is perhaps quite as good as in any other in-door occupation; but it is a fact of great significance that in not fewer than two-thirds of the whole there is such a dislike to the fat of meat, as induces them to cut it from the meat and leave it. When, however, the income is reduced, they cannot obtain so much animal food and beer; and there can be no doubt that in the great majority of cases, whilst the husband is thus abundantly eating and drinking, his wife and family are much underfed.

Dislike to fat of meat.

Family underfed.

Some of the married men take breakfast at home before going to work, even between 5 and 6 a.m., but by far the majority of tailors walk one or two miles to the shop without food, and take breakfast, lunch, if any, dinner and tea, in the shop; and with the exception of one shop only, they eat it whilst sitting, and suspend work only for a short time. No regular intervals for meals are pre-arranged, and no opportunity is giving for a walk during the working hours, on the plea that in busy time the pressure of the work does not allow such loss of time. As it is a choice of evils between thus working continuously and remaining more frequently to a later hour at night, it is perhaps not possible to say that when a choice is necessary the present plan is the worst; but when no such pressure of work can be pleaded, it becomes an evil which demands the usual remedy. As, however, the workshop is associated with the retail shop or office, and these are not closed at the meal hours, the master prefers that his men shall remain to do any work which customers coming during that time may require.

Breakfast, where eaten.

Absence of intervals for meals.

There is no provision for cooking in any establishment (except one), and the food is apparently well supplied from without.

Diseases.

The complaints or diseases to which reference was most constantly made by the operatives are—

1. Colds, rheumatism, and sore throat, obtained either from draughts of cold air entering the hot shop, or from the operative in a state of perspiration going out of the warm shop into the cold passage or into the open air, without putting on his coat; and if the clothes became wet he sits down in them. In part this is a necessary evil, but in other part is confessedly due to the carelessness of the men themselves. The rheumatic pains occurred in various parts of the body, but more usually in the head and shoulders, neck, and back.
2. Indigestion, which occurred most frequently in the worst ventilated shops; and although it did not prevent the taking of a fair quantity of food, it accounted for the spareness of habit of many, by the probability that the imperfectly digested food was wasted by passing off from the bowels. It is highly probable that the deficient respiration already referred to was the basis of this defect.
3. Headache, due to the heat of the shop, the foul air from the burning gas, the close atmosphere, and the effect of draughts of cold air. It was more general in the worst ventilated shops, and where the men drank much at night, and were not cleanly.
4. Giddiness occurring on first rising after many hours sitting.
5. Constipation and piles were common, and fistulas were not at all rare.
6. Consumption was prevalent among the younger, and asthma somewhat common among the elder operatives.
7. General debility, leading to much weakness at night, and indisposition to take active exercise, very frequently complained of.
8. Abscess of the fingers, from pricks by the needle, was not an uncommon accident.

Sick societies.

There are so-called sick societies in all the shops, but with one or two exceptions they do not keep any fund in hand, but a certain sum is collected for such members as are ill. The payment to them varies from five shillings to ten shillings per week, and there is usually a provision that however many may be sick at one time the payment by each member shall not exceed sixpence per week. There are rarely any books regularly kept, as the population is very fluctuating, and as the time over which any return, could be obtained

would not exceed two years, I attach no value to the experience of these societies. *It* must also be added, that tailors afflicted with consumption in the very advanced stage, and enfeebled in a marked degree, as seen in the out-patients room at the Hospital for Consumption at Brompton, are yet able to work during several hours daily, and thus, with so much disease, may not be in receipt of sick pay, and would not be registered as sick cases.

12. Of Tailors in London, by Dr. E. Smith.

I have been favoured by the Registrar-General with a statement of the mortality in tailors in London in the years 1860 and 1861, and also with that in agricultural labourers, and I have contrasted them in the following table :—

ANNUAL MORTALITY PER CENT.

Ages - - -	15	20	25	35	45
Tailors - - -	0·734	0·715	0·958	1·262	2·093
Agricultural labourers	0·423	0·762	0·743	0·805	1·145

The mortality is thus much greater in tailors than in agricultural labourers during the period of apprenticeship, but it is yet more considerable in middle life, the excess amounting to from about 50 to about 75 per cent.

Variation in income.

The income is derived exclusively from piece-work, and therefore varies with the amount of labour which they can obtain. The busiest months are April, May, and June; next follow October, November, and December; whilst August and September and January and February are the least busy seasons. Every shop in the trade feels the effect of season; and whilst the employers can with extreme difficulty obtain sufficient operatives in the busiest, the number employed even by the best houses is greatly lessened at the slack seasons. Hence the steadiest and best workmen obtain the preference when there is but little work to be done, while the great mass of operatives may pass weeks without any employment, or only with one third of one or of two coats per week.

Amount of income.

The remuneration in the best shops and with the men who belong to the trades union is 6*d.* per hour, while others work for 5*d.*, and in some of the slop shops only 4*d.* is allowed. At the former rate, and with steady employment, the operative obtains 36*s.* to 40*s.* per week; and as a certain time payment is allowed for each kind of garment, a quick and enduring workman may finish his work in less time, and by working overtime may gain from 2*l.* to 4*l.* per week when the press of work is very great. In a shop with a good trade, a steady workman who makes 36*s.* to 40*s.* in busy times may obtain 25*s.* in the months before Christmas, and less than 20*s.* on the average of the other months; while with regard to the mass of workmen it is impossible to arrive at an average statement of their income during six or seven months of the year. It may be affirmed of these operatives as a whole, that in the slack time their income is insufficient to maintain them, and they fall into debt; and that with much anxiety and probably insufficient food for lengthened periods the large income of the summer months suffices only to clear off the accumulated debt.

OPERATIVES WORKING AT HOME.

2. THOSE WHO WORK AT THEIR HOMES.

I have already referred to the chief advantage which those obtain who work at home, viz., the employment of the members of their own family, and of other persons from whose labour they obtain a profit; but it is generally believed in the trade that there is a counterbalancing disadvantage in the later hours and the night-work, as well as in the

bad sanitary arrangements of the dwellings, and that the greater proportion of disease and mortality occurs in this class.

In reference to the supposed advantage, I remark that, whilst there is much of even the best work which a boy or a wife can do, and for which men's wages are allowed, it is painful to see how thoroughly the wife is taken from her domestic duties, and how unintermittingly she and her daughters are engaged in the business from breakfast time to a late hour at night. When the work is of an inferior kind, as slop work or sank work, it is quite impossible that the labour of one person could maintain a family, and hence, so far as such labour is necessary, the performance of it at home by several members of the family is most desirable. Advantages of. Disadvantages of.

As to the disadvantages. Work which is given out to an out-door workman from private shops is often required to be finished in a very short time, as, for example, a coat, which is two days work, is given in the afternoon to be made by the following mid-day, and hence the man and his wife must sit up until 1 or 2 a.m., and be at work again at 4 or 5 a.m. In slop work it is customary for the workmen to attend at the warehouse in the morning daily, or two or three times a week, to receive work, and his day's work commences only on his return home at 12 or 1 o'clock, and must be continued until midnight or 1 a.m. This irregularity in the hours of labour and rest is very common, and to it is very generally ascribed the chief evils of the trade.

The dwellings of this class are for the most part very poor and unhealthful, while at the same time the rent is very large in proportion to their income. It is exceedingly rare to find them occupying two rooms, and for the room in which many persons must eat, drink, and sleep. I found the rent in the West End to vary from 5*s.* 3*d.* to 3*s.* 3*d.*, and in the East End, in the back courts of Whitechapel, it was 2*s.* 6*d.* a week. In some rooms, at the Seven Dials, where the government work is done through the sanker, there was no bed, and the whole furniture was perhaps not worth 5*s.*; but generally there was a bed and a few chairs, and in some there was evidence of home comforts. The neighbourhoods were crowded, and the atmosphere impure, whilst the air of the rooms was often very disagreeable. Dwellings and rent.

Those persons who work at home and are good workmen restrict themselves to good work, viz., that for which they are well paid; and when they have no work submit to the loss; but others obtain good work in the busy season, and slop work at other periods, or are limited to slop and sank work throughout the year. There is much variation in the amount of slop and sank work which can be obtained at the different seasons, but less than occurs in the private shop work at the West End, so that while the remuneration which they obtain is small, the income approaches nearly to a regular one. Kinds of work.

The income in this class of persons is always derived from piece-work, and hence will vary both with the amount of work and the price paid for it. The difference which exists in the latter is almost past belief to those unacquainted with the trade, and in the one direction fully accounts for the objection which exists on the part of the slop-houses to let it be made known. As this matter is so closely associated with the sanitary state of the operatives, I will refer to it in detail. Income from piece-work.

The sum which is paid by the West End private tailors for making a frock or over coat varies from 16*s.* to 20*s.*, a morning coat from 12*s.* to 14*s.*, and a jacket from 10*s.* to 12*s.*, according to the extra work which is put into them. It is important to notice these extras, which are as follows:—Full basting (roughly stitching the cloth together that it may be tried on) three hours; half basting, as when coats are usually tried on, one hour; flat braiding, three to five hours; double stitching, Sums paid for making garments.

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four to six hours; extra pockets, above three, 6*d.* each; extra quilting, six hours to eight hours, each hour been paid for by 6*d.* It is singular that different houses of the best class should allow different times for each extra, since the allowance is in part arbitrary, and may exceed the time actually necessary, but in all the extras may amount to several shillings beyond the price of making the coat. 4*s.* 6*d.* is paid for a single-breasted and 5*s.* 6*d.* for a double-breasted waistcoat, whilst 6*s.* to 7*s.* 6*d.* is paid for making a pair of trousers, subject to extra payment for lap-seams, braiding, trouser-straps, waist-buckles, basting, whole-falls, and split-falls.

Good work in private shops.

Cheaper work in advertising establishments.

Private shops which advertise to sell at lower prices give an inferior cloth, and pay from 11*s.* to 13*s.* for making a frock or dress coat by hand and 10*s.* when the sewing-machine is used. They also pay 3*s.* for a waistcoat and 4*s.* to 5*s.* for making trousers. The sum is arbitrarily fixed by themselves, either when the work is given out or received back, and is supposed by the operative to vary with the price which they charge their customers.

The next grade downwards occurs with the handsome advertizing shops in Oxford Street and Regent Street, who pay only 5*s.* to 6*s.* for making a frock coat, 7*s.* for a heavy overcoat, 3*s.* to 4*s.* for a morning coat; 3*s.* to 3*s.* 6*d.* for an Inverness cape, 1*s.* for tweed and 1*s.* 6*d.* for black cloth trousers, and 10*d.* to 1*s.* 3*d.* for waistcoats; and what is particularly to be noticed, no extras are paid for, although often required; and the operative must buy his own sewing materials, at a cost of 3*d.* to 6*d.* for a coat and 1½*d.* to 2*d.* for a waistcoat or for trousers.

It must also be stated that the time required to make these garments is nearly the same, excluding extras, whatever may be the price paid for them, viz., two days (or one and a half day for man and wife) for a frock or dress coat, eight hours to a day for a single and 15 hours for a double breasted waistcoat with sleeves, and nine hours to one day for trousers, or six hours when the machine is used. The garments are also equally well made; but the best workmen are employed upon and give style to the best work.

Slop-work.

Slop-work, which is made for the wholesale warehouses, is paid for after the last-mentioned fashion, but it varies greatly with the material used. Thus 10*d.* is paid for making a boy's jacket, 1*s.* 6*d.* for making woollen blouses, and for a handsome youth's coat, 2*s.* 6*d.* for a mourning coat, and 4*s.* to 4*s.* 6*d.* for a frock coat. Fustian trousers are made for 10*d.*, and cotton cord trousers for 9*d.* per pair less 1*d.* to 1½*d.* per pair for sewing materials, and not more than three pairs can be made by an ordinary workwoman in two days. 5*d.* to 6*d.* per pair is allowed for finishing them after the machine, viz., for fastening the joints, making the button-holes, sewing on the buttons, sewing in the linings, finishing the top edge, pressing the seams, and sometimes the whole trousers, and making and putting in the watch-pocket, of which work a middle-aged woman can do two and a young woman three pairs per day, at an expense of ¾*d.* to 1*d.* per pair for thread.

Sank-work.

The worst paid work is sank or government work. The allowance for the infantry cloth trousers is 1*s.* 2*d.* per pair, and white ducks 5½*d.* per pair, at the Army Clothing Depôt. Police double-breasted dress coats are made from 2*s.* 6*d.* to 2*s.* 9*d.*; and those for the London and North-western Railway for 3*s.* 6*d.* Frock coats for postmen 2*s.* 6*d.* to 2*s.* 9*d.*, and it is said that sometimes only 1*s.* 6*d.* is paid by the middlemen. Policemen's fine trousers are made for 1*s.* to 1*s.* 2*d.*, and the coarse night trousers for 10*d.* to 1*s.* Volunteers' coats for 2*s.* 6*d.* to 4*s.*, and those for the Lancashire volunteers for 2*s.* 8*d.* New Zealand cloth blouses are now being made for 1*s.* 2*d.* In all these cases, except the

work obtained from the Clothing Depôt, the operative finds the sewing materials.

The income derived from these different kinds of labour varies very much, and greatly depends upon the number of persons in the family who do the work. When the husband works alone and at good work he may obtain higher weekly wages than he could gain in a shop, and this advantage will be greater when his wife or a child can render him some aid. I found several cases at the West End where from 3*l.* to 4*l.* a week were obtained by the family thus employed, in the busy season.

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Weekly income in good work.

The second class or ready-make work enables a man and wife to obtain 20*s.* to 25*s.* a week, and a man alone about 18*s.* to 20*s.*, when sufficiently employed. The slop-work will yield 26*s.* to 30*s.* a week when several members of the family work. A single woman will make 5*s.* to 9*s.* a week, either alone or with the aid of an aged mother. When paid by the day she will earn 12*s.* or more at the best work if a good workwoman, and from 6*s.* to 10*s.* at inferior work. A good machinist in the Government Depôt and in the wholesale houses obtains from 10*s.* to 16*s.* a week, and an ordinary hand from 8*s.* to 12*s.*, whilst learners, after the first three or six months, receive 6*s.* to 8*s.* The finishers obtain from 8*s.* to 10*s.* when employed in shops, but when at home, and engaged on inferior work, the amount will vary from 6*s.* to 8*s.* A man making policemen's coats does not earn 13*s.* per week.

Second-class work.

Cost of sewing materials.

In all these instances from 1*s.* to 2*s.* per week must be deducted for the cost of sewing materials; a deduction which appears to be without reason, seeing that the thread, silk, and twist are as essential in the making of the garment as the cloth, buttons, and other trimmings, and should be provided by those who find the latter.

Lowest class work.

It is impossible to estimate, with any approach to accuracy, the average income of these lowest classes of the trade during the year, since during three or four months of the year the work is always deficient, and for weeks may be entirely absent. If the operatives can only just live when the work is moderately plentiful, what must be their state of distress during such periods of dearth of employment!

Sickness and mortality.

I do not know of any means by which a correct estimate may be made of the sickness and mortality occurring among those classes. They must vary very much, according to the kind of work which the operatives do, and the seasons of sufficiency and want; but I cannot doubt that it is exceedingly high in the lowest grades, and far exceeds that observed in men working in the West End shops. The introduction of the sewing machine has so far benefited the operative that the machinist is better paid than the needlewoman, and has a less unhealthy occupation; also, that when an operative can afford to have one or more machines he will do more work in the same time, and may gain by the labour of others, and on slop work he is paid the same whether the work is done by machine or by hand; but it has lowered the price of work, and hence has hitherto injured the condition of those who have still to do their work by hand. At present the chief gain has been to the employer of labour.

Effect on growth of girls.

There can be no doubt that the unintermitting labour of young girls interferes with their growth and induces constitutional disease.

Middlemen;

As the gain of the middle-man is understood to be the loss of the operative, and presses almost entirely upon the lowest class, this is a convenient place in which to refer to that class of persons.

Gains of.

The mode by which gain is effected varies much. Thus in the private West End trade a middle-man aids the employer by doing a large quantity of work for him when business presses heavily, and has

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thus a fair claim to a good share of the work which is obtainable in the slack season. He is further of advantage by doing all the work in the same style, since each house of business aims to have a style of making peculiar to itself. The middle-man in such a case has the advantage of employment for himself and family when others cannot obtain it; and since he must have the best workmen, and must pay them the usual sixpence per hour, his only further gain *is the* extra amount of work which a swift workman will do in a given time, and for which the middle-man charges as if it were done at the usual speed. Hence he may gain a few shillings per week from each man's labour, and in return benefits the operative by finding him employment.

Another mode, but among an inferior class of workmen, is to take lodgers who cannot give security to the warehouse, and charge them each 4*s.* a week for their lodgings and tea and sugar, and provide them with employment on their own security at the price which they obtain. Others engage a few workwomen at daily or weekly wages varying from 6*s.* to 9*s.* per week, and gain by cutting and pressing the work themselves, and by making it for a less sum than they obtain for it. This is done in slop and sank work only.

The greater number are, however, such as give the work which they receive to out-door workers, and gain a profit upon each garment. I have tried in vain to ascertain from such men what profit they obtain, but have learnt it in some instances from the workmen and workwomen who do the work. The profit upon a coat varies much, from 1*s.* even to 6*s.*, it is said, on some volunteers' coats, 6*d.* on police coats, 4*d.* upon a New Zealand blouse, and 5*d.* to 1*s* 3*d.* on other blouses, 6*d.* to 10*d.* on a government tunic, 2*d.* on police trousers, 9*d.* on cavalry trousers, and 2*d.* to 4*d.* on infantry trousers. When they machine the work on the premises, and send it out to be finished, the profit is much greater; and when they obtain sewing trimmings, as at the Army Clothing Depôt, and withhold them from the operative, their gain is further increased.

Advantages of middlemen to the operative.

Such is one *aspect of* the question; one which presses very heavily upon the helpless; but there is another which is favourable to the operative. As the sweater or sanker lives near his workmen, the latter avoid the great loss of time required when they attend at a distant warehouse, and as the former knows the workmen he allows them to have the materials without first requiring the security, which could not be given, but which would be an indispensable condition of their obtaining work from a warehouse. Moreover the government pay only on one day in the week, and many workpeople cannot afford to be so long without their money, whilst the middleman pays them daily as the work is done. Hence some are employed who otherwise could not gain work, and when employed save time, which in part repays the deduction from their wages.

Royal Army Clothing Depôt.

The Army Clothing Depôt is a most useful and well-managed institution, providing work within the building to many hundreds of women, who machine and finish the work, and to a large number of persons who are out-door workers. Like every other institution, it is limited in its capacity to supply work; and new hands, however well recommended, can be taken on only when a vacancy occurs. As many of the workpeople live several miles from the establishment, and no single person can have more than two garments in hand at once, it follows that several hours must be lost in every second or third day, and the health exposed to much risk in wet and cold weather in attending at the depôt. The wages obtained by those in the establishment are good, and are increased by the saving which the cutting machine and

other arrangements have effected in the work. The sanitary state of the building is good, and the operatives appeared in a full average degree of health.

The following are the conclusions at which I have arrived from this inquiry :—

Conclusions.

1. The sanitary conditions under which tailors live are exceedingly unfavourably to health.
2. Overcrowding, ill ventilation. and excessive heat are especially found in shops ; whilst irregularity in work and night-work are especially met with in those who work at home.
3. Men working in shops at the West End of London obtain better food than those who work at home, and much better food than their own families obtain at home.
4. As a rule, tailors working in shops eat animal food of some kind thrice a day, and are whilst so working sufficiently fed.
5. The moral and social habits of tailors have much improved of late years, but excess in the use of beer is still very common, and about one fifth or one sixth drink ardent spirits daily.
6. The diseases of tailors are, chiefly, colds, sore throats, muscular pains, rheumatism, indigestion, headache, bilious attacks, constipation, piles, asthma, and consumption.
7. The amount of respiration, and therefore of vital action, is insufficient for health, and whilst perspiring, or with the skin exceedingly sensitive, they expose themselves to cold air, and take cold,—conditions directly tending to the production of chest diseases.
8. The mortality as shown by the Registrar General's returns is much higher than that of agricultural labourers.
9. Consumption and other forms of chest disease are the most frequent cause of death, and constitute two thirds of all the causes of death.
10. My own observation leads me to the belief that they are a feeble and sensitive class, and in only a very small minority of cases give evidence of health equal to those engaged in many other in-door occupations.
11. The chief causes of disease are preventible viz., ill-constructed, ill-ventilated, over-crowded, and over-heated shops; prolonged maintenance of the sitting posture ; exclusion of meal hours, and a walk in the middle of the day; excessive sensibility of the skin, and injudicious exposure to cold.
12. The over-crowding, ill ventilation, and unhealthy position of the workshops are so great as to demand public attention, and inspection by the government, with a view to their improvement.
13. Irregularity of income is a prime source of injury to the operatives, since at one period the income is very large in relation to their daily wants, and at others is very uncertain, and for prolonged periods quite insufficient to maintain their families. This has not, as it should have done, led to thrift and saving in times of plenty, but rather to recklessness and unsteadiness of character. Philanthropic efforts might well be directed to this class, with a view to induce them to make provision for seasons of dearth of employment.
14. It is probable that as this is due to variation in the wants of the public with the seasons of the year it is in great part irremediable.

15. Slop and sank work is less variable, but still is far from being uniform in its supply of labour from week to week.
16. The difference in the price paid for labour by the private shops on the one hand and the large advertising shops on the other is extremely great, and from all I can learn is less beneficial to the public than to those employers of labour.
17. In slop and sank work the barest living can be obtained only by constant and unremitting labour, but it provides employment for a large number of single women, widows, and others, by which they live.
18. The system of middle men is far more convenient to employers than beneficial to the operatives, and is an oppression of the helpless.
19. The general sanitary and domestic condition of tailors, whether male or female, and whether working at the best or at the worst paid work, is almost universally very low, and in striking contrast with the large wages which many obtain in the busy seasons of the year.
20. Machine work lessens the value of labour, but is beneficial in a sanitary and pecuniary point of view to such women as can obtain it.
21. Improved and cheaper dwellings are greatly needed by this class of operatives.

Nos. 13, 14.—Residence in Marsh Districts.

No. 13.—Report by Dr. George Whitley as to the Quantity of Ague and other Malarious Diseases now prevailing in the principal Marsh Districts of England.

Having received instructions to make, for the information of the Lords of Her Majesty's Council, an inquiry into the sanitary state of the principal marsh districts of England, and to turn my attention first to the more important districts on the east coast, I made Sheerness the starting point of such inquiry.

The sources of information pointed out to me for the purpose of my inquiry were medical men (private and parochial), registrars of deaths, schoolmasters, records of hospitals and dispensaries, questioning of the inhabitants, and inspection of localities.

At a very early stage of my inquiry it became evident that any reliable statistics of the proportionate prevalence of intermittent disease could be obtained in a very few places only.

There are several reasons for this. Even where hospitals or dispensaries exist, the records, though sufficient no doubt for the business purposes of the respective institutions, are often entirely useless for any study of disease. Thus, at the Rochester, Chatham, and Strood Dispensary (established 1832), although the number of patients admitted each month was carefully noted, it had never been the custom to put down the disease from which they were suffering. Further, the medical men informed me that in districts where ague still prevails a large number of those affected purchase quinine from the druggists, and never apply for skilled advice at all.

Private practitioners can very rarely indeed furnish any numerical account of their ague patients, and even the books of the poor law medical officers are often too badly kept to be available to any great extent for statistical purposes.

Under these circumstances, I came to the conclusion that, except in a few cases where hospital and dispensary records were carefully kept, I must content myself with such approximate general evidence as I could obtain from the several sources mentioned above.

As regards the form of my report, I have thought it best to give, —

1. A general account of each place visited;
2. and 3. Some remarks under the heads mentioned for inquiry in my instructions; and
4. A supplement containing such medical information as I was enabled to obtain.

1. GENERAL ACCOUNT OF PLACES VISITED.

Sheerness.—Mr. Keddell, union surgeon, who has practised in Sheerness for more than 40 years, stated that there has been a decided decrease in the amount and severity of intermittent and remittent diseases of late years in the island of Sheppey, especially since the year 1860; that these diseases are not localized in Sheppey at the present time, the number of cases in proportion to the population being as great in the upland parts (Eastchurch and Minster) as in the lowland; that neuralgia has been rather more prevalent during the last five years, chiefly tic in the head, rather continued than periodic; that there is much less enlargement of spleen than formerly; and that dysentery and enlargement of the liver are rare.

Mr. Keddell attributed the decrease in the amount and severity of these affections to the large amount of surface drainage carried out of late years, both in arable and pasture lands; to the conversion of a great amount of pasture into arable land; and, to some extent, to the improved circumstances of the population.

Mr. Keddell further informed me, that the general sanitary condition of Sheerness has been considerably improved lately, in reference to drainage and the removal of nuisances, and that there is now a fair supply of good water from artesian wells.

On board the flagship Formidable I learnt that very few cases of ague occur, and that these are almost entirely instances in which the disease has been contracted elsewhere, especially in China. The same was said to hold good generally for the other vessels in the harbour.

Mr. Ward, surgeon to the Artillery Hospital, could only give me the desired information in reference to the last three years. The average strength of the garrison had been about 1000, and the ague cases annually about 15, but the patients had, for the most part, previously had ague elsewhere.

At the National School I found that the mistress was absent from Sheerness, and that the master had been there only a few months. The Rev. Mr. Wilson, who has taken an active part in the management of the school for several years, told me that the number of children had increased, and that he now heard but rarely of ague amongst them.

Neither from the registrar of deaths, nor from any other source, could I ascertain that ague now ever proved fatal, and the impression generally seemed to be that the disease, as now existing in the island, is by no means of a formidable character.

The soil of Sheppey is chiefly a stiff clay, and more than half the island lies low, this portion being, for the most part, two or three feet below high-water mark.

It may be well to mention here, that ague prevailed to an unusual extent during the years 1858 and 1859 in most of the districts where it is still met with as an endemic; that it appeared in those years in

APPENDIX.

Nos. 13, 14. *Residence in Marsh Districts.*

13. Ague and other Malarious Diseases, by Dr. Whitley.

places, especially elevated ones, where it was previously almost or entirely unknown; and that in many places the wet summer of 1860 seems to have been the starting point for the decrease of intermittetn affections.

Milton.—Mr. Ray, union surgeon, stated that intermittent disease is rather common in the neighbourhood, but not severe in character, the tertian form being the usual one, and that a good deal of neuralgia and rheumatism exist. He could not furnish me with any statistics, a large proportion of the cases occurring amongst club patients, of which no record is kept.

At the Milton National School, with a yearly average of 100, the master stated that it was rare to have three or four absent at once on account of ague, but that in spring, and still more in autumn, one-eighth to one sixth of the number are more or less affected in some years.

The soil around Milton is clay, highly tilled. The marshes towards the river Swale are in the same state as to drainage in which they have been for many years, but are very thinly populated. The latter remark applies to the marshes generally on the banks of the Swale, including those on the south side of Sheppey.

The general sanitary condition of Milton as regards drainage and non-removal of nuisances is unsatisfactory; but the local authorities are beginning to see the necessity of more energetic measures. There has been a considerable amount of typhoid fever at times; and scarlatina in a severe form was prevalent at the time of my visit (October 18).

At the Sittingbourne National School, yearly average 130, there had never, for some years, been more than three or four children absent from ague at once. There had been *no* case this year, either on the boys' or girls' side.

Here, as in the adjoining town of Milton, the drinking water is obtained from wells, and, except for its hardness, did not appear in any way objectionable.

Faversham.—Mr. Hoare, union surgeon, with 26 years' experience of the neighbourhood, stated that there is scarcely any ague met with now, either in the immediate neighbourhood of Faversham, or in the adjoining parishes; but that in the dry summer of 1859, in which certain springs near Faversham dried up, exposing surfaces to evaporation which commonly remain moist, many severe cases of ague occurred. When he first came to Faversham, ague was very common, and both severe and obstinate. The marked decrease in the amount and severity of intermittent disease he attributes to the extensive drainage of the land, and to the felling of much timber, which latter circumstance he regards as the cause of the occasional occurrence of such disease in upland spots where it had been previously unknown.

At the Faversham large National School, and at the smaller one of Ospringe, about a mile distant, where ague was formerly very rife, I also found that, except in 1859, when many of the children suffered from that disease, it was now both rare and mild in form.

The general sanitary condition and water supply of Faversham were stated to be satisfactory.

Chatham.—Well marked ague appears to be very rare. At St. John's National School, average 200, the master was not aware of any case in the last six years. At St. Peter's, average 250, the master remembered one case only in the last two years. At the Chatham Parish National School, no case in last two years.

Dr. Sommers informed me that in the Royal Engineer Barracks at Brompton, strength 780, six cases had occurred last year, but that in two of these the disease had certainly been contracted in China, and in the others probably elsewhere than in Chatham.

At the Melville Hospital, amongst 1600 marines, five cases had occurred during the present year.

At the Rochester Dispensary, where no record of diseases is kept, and from one of the union surgeons, I learnt that neuralgia, chiefly of the head, and cases of irregular intermittent, without distinct paroxysms, both amenable to quinine and iron, are not very uncommon, but that even these have decreased of late years, though more prevalent about 1859.

The drainage of Chatham is bad, chiefly cesspools being used for night soil; and the town generally is very dirty.

Typhoid fever is said to be usually present, and other zymotic diseases frequent. No complaints were made about drinking water.

There is a Local Board of Health for Chatham proper, with a tailor as surveyor and inspector of nuisances, but little has been done so far for the improvement of the town.

Maidstone.—Dr. Monckton, physician to the Maidstone Infirmary, preferring to give information more in full, writes as follows:—

"Maidstone, though lying in a low basin, with a river running through it, is certainly not a birth-place of ague, and we attribute this to the wonderfully porous nature of the subsoil. Our ague is imported. In private practice very little is seen. Cases occur at the hospital now and then, and did so in large numbers in 1859, when there seem to have been 10 times as many cases as in any year since; but almost all were either non-natives, or natives who had gone away to catch the ague. Intermittent neuralgia is rare also. Moreover, these diseases are mild with us, except where receipt of poison has been repeated season after season, and ague become a second nature; 95 cases out of a 100 afflict but lightly, and yield easily. Tendency to recur is our greatest trouble. In our neighbourhood the practice of land drainage is almost unknown, there being ample natural percolation. Our town is fairly healthy, though relaxing. Most of it is sewered, and the rest becoming so. A new water company has been now for two years in active operation, and the water supply is good. The population cannot be called overcrowded."

Dr. Woodfall gave me information confirmatory of the above, and stated that ague had prevailed rather extensively in the villages round Maidstone in 1858 and 1859, after which it declined, but that there had been rather more this year.

The surveyor of roads informed me that a large portion of the town is drained for the reception of nightsoil, with flushing from the surface drainage and outfall into the river, and that a committee of the Town Council are at present occupied in completing the drainage of the town, under the superintendence of Mr. Wicksted of London.

Hoo.—Mr. Wright, union surgeon, informed me that the cases of ague met with were chiefly amongst the navvies working in the marshy neighbourhood of Grain.

The following table applies to a population of about 2350 souls in Hoo union:—

Ague Cases occurring in—	Workhouse.	District.	Total.
1852 January to December -	9	1	10
1853 " " -	9	6	15
1854 " " -	7	5	12
1855 " " -	8	8	16
1856 " " -	6	9	15
1857 " " -	9	23	32
1858 " " -	25	37	62
1859 " " -	16	45	61
1860 " " -	10	33	43
1861 " " -	7	25	32
1862 " " -	14	26	40
1863 January to October -	5	4	9

Mr. Wright further stated, that the drainage of the neighbourhood had been much extended of late, and that he believed there had been much less intermittent and other disease during the last four years. The condition of the population has improved lately, partly from the establishment of brickfields and rise in wages.

Gravesend.—Dr. Armstrong, who has been in practice more than 30 years here, stated that ague is greatly on the decrease in the district, as well in reference to the severity as to the number of the cases. The most severe cases amongst his dispensary patients come from Essex. When the cement works were established at Northfleet a few years ago, many cases of ague occurred amongst the workmen, but the number has now greatly diminished. Some cases of enlargement of spleen are met with, chiefly from Essex, but liver complications from malarious disease are rare, and dysentery still more so.

Mr. Whitcombe, union surgeon of nine parishes round Gravesend for last 20 years, confirmed the above account of the great decrease of intermittent disease in this district, which both these gentlemen attribute to the improved tillage of the land, and cutting down of trees and hedgerows; partly also to better food obtainable by the population.

From the books of the Gravesend Dispensary, as kept since the present dispenser has been there, I was enabled to ascertain that there had been admitted in—

——	Total of Cases admitted.	Intermittent and Remittent Cases.	Neuralgia.	Enlarged Spleen.
1856	1200	61	10	3
1859	1490	371	5	None.
1860	1220	235	5	None.
1862	1129	111	7	None.

a large proportion of which came from the Essex side of the river. The worst place on the Kentish side near Gravesend is Northfleet Creek.

At the Gravesend National School, with an average of 115 children from town only, the master believed ague to be very rare at any time.

The drainage of Gravesend is not satisfactory, though on visiting the town with the inspector of nuisances I did not observe any places in which the general sanitary condition was strikingly bad. There is a fair supply of good though hard water.

Rochford.—Dr. Grabham, who commenced practice here 47 years ago, stated that ague was formerly extremely common and very severe,

but that it had been gradually on the decrease until he ceased to practise a few years ago. He was not aware of any deaths from this disease, and had observed but little neuralgia. He attributed the great decrease to the large amount of surface drainage carried out in a gravelly soil during the last 25 years.

Mr. Oswald, union surgeon of nine parishes, though only nine months in the neighbourhood, was of opinion that very little intermittent disease now occurs in this district.

At the Rochford National School, annual average 130, the master, who had been there 30 years, stated that as lately as 15 years ago ague had been very common amongst the children, and that in 1859 there had been an unmistakeable increase, but that during the last year scarcely a case had occurred, either in the school or in a club to which he belongs.

Rochford, being situated chiefly on high ground, with a gravelly soil, is well drained naturally, and has a plentiful supply of good water from wells.

Orsett.—Dr. Corbet, union surgeon, had been in practice here nearly 40 years, and said that there is now but little ague in Orsett and its immediate neighbourhood, but that it is still not uncommon, though no longer very severe, in some adjoining parishes, viz., Mucking, Bulpham, and Corringham.

He attributes the marked decrease to improved drainage. There was a marked increase in 1859, as shown also by books of provident club, and by testimony of the master of the national school. Dr. Corbet, speaking from memory only, thought that during his long practice at Orsett he must have seen as many as 30 cases of death from ague during the cold stage; but as this is so little in accordance with all the evidence obtained elsewhere, it would seem probable that the number of such deaths is somewhat overstated.

Romford.—Mr. Davey, surgeon to Romford Union Workhouse, informed me that Romford and its neighbourhood are peculiarly exempt from ague, except that one or two cases occurred in the town itself in 1859. There are several cases occasionally in the workhouse, but these belong chiefly to Rainham or Grays. The town has also been very free for a long period from serious epidemics of any kind, in spite of a bad sanitary condition as regards drainage and water supply. The present Local Board of Health consists chiefly of men opposed to sanitary improvement. Three years ago, under pressure of a threatened mandamus, an efficient system of drainage was carried out under Mr. Gotto, with main sewers for east and west parts of the town, meeting at some distance outside it, with deodorizing works, but remains unused at present on plea of want of water. A full and good supply is, however, expected in about three weeks from Grays. Of two wells on Mr. Davey's premises, the one was poisoned at the time of my visit from an old drain, the other dry through the brewery works.

Maldon.—Mr. Tomlinson, union surgeon of six parishes to the east and south, including the most marshy parts of the neighbourhood, stated that there is not now $\frac{1}{100}$ of ague that existed 20 years ago. The greatest prevalence of late years was in the month ending November 2d, 1859, in which there had been 35 cases in his whole district. He could not furnish me with further statistics, not keeping any record of club cases, and so many persons of all classes treating themselves. He said there had been an unusual amount of agricultural improvement in the neigh-

bourhood, and that the condition of the farm labourers is much better of late years. Was not aware of any deaths from ague. Neuralgia rather frequent.

At the national school, the master, who had been there 15 years, told me that ague was much more common among the children when he first came than at present, as many as three or four being sometimes absent at once out of 45 children.

The general sanitary condition of Maldon was said to be good, including the water supply, and there has been but little epidemic disease, except diphtheria.

Ely, including *North Witchford*.—Mr. Muriel, surgeon of Witchford District and Workhouse, 18 years in practice, informed me that where one case of ague occurs now twenty were met with 15 years ago. In the workhouse the disease is almost unknown now. There are three or four cottages in Witchford, on the edge of the fen, where the drainage has not yet been properly carried out, and where ague is generally present.

All the low ground in this district is peaty, and when well drained becomes even too dry for agricultural purposes, until remedied by bringing the clay sub-soil to the surface, and mixing it with the peaty soil. To the extensive drainage which has taken place of late years in such land the great decrease of intermittent disease is no doubt chiefly attributable. Mr. Muriel never had a death from ague. He further informed me that there is an efficient Local Board of Health at Ely, and that both drainage and water supply are good.

Norwich.—Dr. Eade, who commenced practice at Blofield in 1847, and has now been in Norwich itself for several years, informed me that ague is now very rare in this district.

The house surgeon of the Norwich Hospital, where there are 150 beds, and nearly 1000 in-patients annually, stated that from his now observation of late years, and from inquiry from medical men in the neighbourhood, he had concluded that ague is very uncommon. He furnished me with the following extracts from the hospital records.

Cases of ague admitted into Norwich Hospital :—

1820	-	2	-	both cured.
1821	-	3	-	all „
1830	-	3	-	„ „
1831	-	4	-	3 „ 1 died.
1840 none.				
1841 none.				
1850 none.				
1851	-	1	-	cured.
1858	-	1	-	„
1859	-	4	-	„
1860	-	1	-	„

The mistress of the model girls' school, average 140, had never heard of ague amongst the children during her two years' residence.

In reference to the general sanitary condition of Norwich, I learnt that the Local Board of Health is efficient, the drainage good, except that the outfall is into the river within the city, and that a plentiful supply of good water is obtained from the river.

Walsingham.—Ague very rare, except some cases in 1859. General sanitary condition said to be good, with abundance of soft water from wells.

Wells.—Mr. Rump, senior, who had practised here for 50 years, stated that ague was formerly very rife, but rarely, if ever, fatal.

Congestion of spleen and liver were met with occasionally, but little neuralgia. Both he and Mr. H. R. Rump, his son, did not regard intermittent diseases as endemic in the district now, though accessions occurred occasionally. Thus, on one or two occasions when tracts of marshland had been reclaimed from the coast near Wells, numerous cases occurred during the first drying period, before thorough drainage could be carried out. There are considerable tracts of marsh along the coast, extending eastwards from Wells, still unreclaimed, but these, in their present condition, do not appear to be productive of malaria.

The general sanitary condition of Wells is very bad, chiefly from neglect of the existing means of surface drainage in many of the courts and alleys.

A pretty extensive system of deep drainage of the town has been carried out within the last few years, at a great expense; but this cannot be used at present as there are no means of flushing the drains, and no available funds for the completion of the proposed waterworks. There is, however, a plentiful supply of good drinking water from wells.

Lynn. — In the marsh district westward of Lynn, at Walpole St. Peter's and Terrington St. John's, where there is a heavy clay soil, intermittent diseases of severe form were prevalent 20 years ago, but drainage having been carried out very extensively in the district, these affections are now much less frequent and severe.

Mr. Kendall, union surgeon for part of the above district (Freebridge Union), scarcely meets with any cases now, and the same appeared to be the case in the other portion of that union on examining the books of the medical officer.

The Rev. Mr. Clark of Wootton, about two and a half miles east of Lynn, who had taken much interest in the question of ague, stated, that with the exception of a few cases in 1859 the disease is now extremely rare, though he had heard that it was very common 50 years ago.

At the Lynn Hospital I found no records available for my inquiry, but the members of the medical staff whom I saw there confirmed the account I had already received of the great decrease of intermittent disease of late years, which they concurred in attributing to the increased drainage of the land.

At St. Margaret's National Schools, average 220, the master had no recollection of any cases of ague amongst the children during the last five years, except in the case of one family.

The sanitary authority is a committee of the Town Council, and does not appear to be efficient, as some portions of the town are in a filthy condition, especially an open fleet in the centre of the town (called Purfleet), into which the privies of a large number of houses empty themselves. Such deep drains as exist in the town are not intended for the reception of night soil.

Notwithstanding this, Mr. Kendall informed me that Lynn has been very free from epidemics.

There is a plentiful supply of good water laid on.

St. Ives.—Mr. Girling, union surgeon, stated that when he first came, 30 years ago, there was a good deal of ague, which decreased gradually in amount and severity, and that within the last 10 years he has scarcely seen any cases. He never knew any deaths to occur from this cause, and only remembered one case of much enlargement of spleen; none of liver.

Extensive drainage of the land has taken place within the last 20 years, the soil being chiefly clay or gravel.

There is fair drainage of the town available for night-soil, but not much used yet, and a good supply of hard water. Mr. Girling said that the town is generally healthy, and has been very free from epidemics.

Wisbeach.—Mr. Groom, union surgeon of 15 years standing, had seen very little ague of late years, except in autumn of 1859. Formerly much more common and severe, with enlargement of spleen, which he no longer meets with. Type now obscure, but intermittent. No deaths. Mr. Wales, now retired from practice, confirmed the above statement. Much drainage of late years in whole neighbourhood. Soil peaty, with subsoil of silt, which it is now usual to turn up out of trenches and mix with surface soil.

There is a fair system of drainage for the town, but no means of flushing the drains at present. Cesspools are used chiefly. Few epidemics had occurred, it was said, except amongst children. Water supply deficient, from three sources; viz., from wells which are affected by the tide, and in which the water is more or less brackish; from river Nene above the town, and from ponds, sometimes sold to the poor; and rain-water stored in cisterns, which is preferred for household purposes. There are waterworks in contemplation, but these are not likely to be completed at present.

Whittlesea.—Mr. Crisp, union surgeon for last 20 years, did not see a single case duing first seven years of his practice. Since then has seen a moderate amount of mild form, with some remittent fever amongst children. Had been told that ague was very common in this district before his time, and that whole families were sometimes affected for many months together. Observed several cases in the summers of 1857 and 1860, but can offer no explanation of their occurrence. Never saw any deaths from ague. Has seen perhaps 10 cases of neuralgia within the last eight months.

At the National School, average 105, the master, who had been there 12 years, could not recollect any well-marked case of ague amongst the children during that time. Previously to coming there he had been told that the place was habitable by natives only on account of malaria.

Sanitary authority, a committee of the board of guardians, with an inspector of nuisances. General state of town good, with exception of one spot where there are overfilled privies in front of the houses. Several cases of typhoid fever occurred here two or three years ago, of which none proved fatal. The first case, which was severe, was that of a woman who had not been away from home. There is a plentiful supply of hard water.

Peterborough.—Dr. Paley, physician to the Infirmary and Dispensary at Peterborough, kindly furnished me with the accompanying table of intermittent and remittent cases (the latter under the title of "Irregular Ague"), treated at that institution since 1815. He informed me that these cases come almost invariably from the fens of Lincolnshire and Cambridgeshire, and that he could give no satisfactory explanation of the curious variation in the frequency of intermittent diseases observable at certain periods in the table. In his triennial report to the governors, January 1860, he says, "That the first effect of the improved drainage of the large fen districts in our neighbourhood, especially those which were formerly constantly covered with water, like Whittlesea Mere, has been to rather increase the prevalence of ague, was reasonably to be expected, inasmuch as a much larger surface of decaying vegetable matter has thus been exposed to the

"action of the sun and air. Probably some years must still elapse "before the full benefit will be experienced." Only one death from ague is recorded out of nearly 4,000 cases treated during the last 14 years, and of this he says—"I am by no means certain that the ague "alone caused his death, as he was a distant country patient who was "not seen for some time before his death."

In the same period of 14 years, ending 1859, there were also treated, of neuralgia, 1,205 cases, the great majority of which were easily cured; of rheumatism, 347, of which two proved fatal.

Cases of enlargement of the spleen are rare, and no dysentery of malarious origin is met with.

At the National School, average 110, the master, who had been there only two years, was not aware of any cases of ague amongst the children during that time, though about 20 of them come from the fen district.

There is peat-land to the east in the neighbourhood of Peterborough, the subsoil in the other directions consisting chiefly of limestone or gravel.

A Local Board of Health has been in existence here for 13 years, with a surveyor and inspector of nuisances, and it was stated that the general sanitary condition of the town is good, and that there have been few epidemics. Nearly the whole of the town is drained, with outfall into river, partly within, partly below, the town, and the remaining portion is near completion, but the drains are not available for nightsoil at present, as there are no means of flushing them. One drain, however, about 600 yards long, which can be flushed, is used for nightsoil by an old right connected with the sec of Peterborough.

There are no waterworks, but a fair supply of hard water.

TABLE of INTERMITTENTS, from PETERBOROUGH INFIRMARY BOOKS, as occurring among the Out-Patients.

——	Ague.	Irregular Ague.	Total Admissions.	——	Ague.	Irregular Ague.	Total Admissions.
1816	10	8	254	1840	10	91	1006
1817	10	32	533	1841	19	63	912
1818	12	79	619	1842	29	60	932
1819	30	68	602	1843	37	10	983
1820	106	41	635	1844	1	26	1089
1821	92	87	730	1845	4	40	1054
1822	110	34	808	1846	60	99	1956
1823	232	78	847	1847	61	89	1043
1824	41	58	663	1848	143	81	1346
1825	120	11	936	1849	171	154	1849
1826	254	124	1112	1850	184	108	1858
1827	507	118	1207	1851	143	137	1902
1828	449	189	1378	1852	145	120	1959
1829	376	237	1161	1853	208	97	1713
1830	62	133	769	1854	279	59	2444
1831	49	143	980	1855	119	99	2135
1832	103	172	859	1856	126	112	1656
1833	92	159	834	1857	171	123	1720
1834	32	193	801	1858	263	119	1638
1835	97	246	916	1859	172	117	1437
1836	50	141	844	1860	270	117	1722
1837	24	148	1057	1861	90	80	2153
1838	24	56	850	1862	131	118	2076
1839	11	62	677	1863	129	133	2223

APPENDIX.

Nos. 13, 14. *Residence in Marsh Districts.*

13. Ague and other Malarious Diseases, by Dr. Whitley.

In a letter, dated 26th December, containing the above entries for the last four years, Dr. Paley writes—"From what I know myself, and "from the reports of my geological friends, I believe clay is present "under the peat in nearly every part of our fens. Often there is a "thin layer of clay between two beds of peat, and then below all the "deep bed of Oxford clay, I have always hoped that the drainage of "Whittlesea Mere, about five miles from Peterborough, and its sur-"rounding bogs, which took place, I think, about eight years ago, "would materially diminish the number of our ague cases. So far, it "has not done so. Perhaps it takes a long while to change the nature "of the soil."

Bourne.—Mr. Nicholls, who has been 40 years in practice here, and whom I was unable to see at the time of my visit, writes—"Inter-"mittent and remittent diseases are greatly on the decline, both as "regards frequency and severity, since the improved state of drainage "of the town and surrounding district, and more particularly marked "is this alleviation since the introduction of waterworks in the place. "Although we have occasional outbreaks of intermittent and remittent, "with neuralgic attacks, they yield more speedily to remedies, and are "not attended by so much enlargement of the liver or spleen as "formerly, and dysentery is of rare occurrence. Scarlatina and measles "of a severe type prevailed during the last autumn. A peculiar "feature of this place is, that during all the visitations of Asiatic "cholera scarcely one (if one) case of the true disease ever occurred "in it."

The general sanitary condition of Bourne appeared unusually good, as there is a good and extensive system of drainage available for night-soil, with two sources for flushing the drains, viz., the so-called "Well Head," a large spring to the south-west, and the surplus water of the waterworks to the north-east of the town. There is an ample supply of hard water from both these sources laid on in the town.

Spalding. — Intermittent and remittent fevers are still frequent around Spalding, though described as much less severe than formerly. Dr. Cammack stated that the years in which these affections were most prevalent were 1808, 1826, and 1827, after which they gradually decreased both in amount and intensity. There was a considerable increase, however, in 1857, 1858, and 1859.

Dr. Cammack's books for 1826 showed 300 cases of ague in private practice alone, the greatest number occurring in the month of September. He furnished me with the following table of cases amongst poor patients during the last five years:

——	Intermittent.	Remittent.	Obscure Remittent.	Neuralgia.	Rheumatism
1859	145	10	40	12	10
1860	87	14	24	10	14
1861	35	27	35	14	10
1862	44	19	28	13	11
1863	27	17	44	14	11

At the National School, average 85, of whom perhaps one fourth attend from without the town, ague had been most prevalent in 1858, when as many as five had been absent at once from that cause. Of 75 boys present at the time of my visit, 11 stated that they had had ague at some period.

From the not very available dispensary records I find—

For Year ending—	Intermittent.	Irregular, including Neuralgia.	Total Admissions.
May 1st, 1859 -	57	22	271
May 1st, 1860 -	82	16	282
May 1st, 1863 -	20	17	241

Spalding is situated in the heart of the fens. The fen proper, to the westward of Spalding, is a black soil, with a subsoil of clay, and is several feet below high-water mark. The marsh towards the sea, where the surface is alluvial, is some feet higher than the heart of the fen. The whole district is now well drained by steam power, and the outfall of the river has been improved. Great improvement has also taken place of late years in the condition of the poor, both as regards their dwellings and their food.

The general sanitary condition of Spalding appears to be pretty good, and the water supply has been much improved by means of water-works. The water is said to contain some common salt. There has been no actual scarcity now for some years.

Holbeach.—Dr. Harper, seven years here, stated that there is comparatively little ague, and that the disease, when occurring, is mild, usually tertian, but not regular as to time of recurrence. There was an increase in the autumn of 1859. Had rarely observed enlargement of the spleen. There is a moderate amount of neuralgia, but no dysentery.

Soil of neighbourhood alluvial to the depth of several feet. There has been a great increase in the drainage during the last 20 years.

The drainage of the town is bad, as are many of the cottages. About five years ago there was a severe epidemic of typhoid on north side, entirely amongst the poor; and about two years ago another epidemic of the same disease to the south of the town, arising apparently in a farm-house, all those in the house being attacked in succession. It also appeared to be carried to two houses in the neighbourhood, distant, one half a mile, the other a quarter of a mile, by persons visiting the first house.

The water supply for the poor is mostly bad, being from pits. A few of the better houses have wells. Rain water is much used for cooking.

Long Sutton.—Mr. Ewen, 35 years in practice, stated that intermittent diseases were both frequent and severe when he first came, and that enlargement of the spleen was frequently met with. For many years, however, except in 1858 and 1859, cases of this kind have been infrequent and mild in form.

The soil is alluvial, and extensive drainage has been effected since 1829, including a portion of the banks of the Wash. Mr. Ewen was not aware of any marked accession of intermittent disease during the reclaiming of the latter.

The town drainage is deficient, and there was a good deal of typhoid fever about the autumn of last year. Dr. Bristowe had been here about March last. The water supply is from wells, the water hard, and if from very deep wells, salt.

Boston.—Mr. Coupland, union surgeon, 45 years in practice, had seen much ague when he first came, but even then the fens in this district had been reclaimed to a great extent. He now scarcely sees any

cases, and no splenic disease. Neuralgia is also rare. There was a slight accession of intermittent disease in 1858 and 1859. The soil is heavy clay or silt, the drainage good, and there is now a large extent of arable land.

As regards the town, the west side was drained three years ago. The fall is slight, and the drains are not yet much used for night-soil, but they can be flushed thoroughly. The east side of the town is very badly drained.

There is an ample supply of rather hard water laid on from Minningsley, 14 miles distant, and there was no scarcity of water, even this summer, which was described as the driest since 1826, but the reservoir is about to be enlarged.

Horncastle.—Ague little known for many years. Horncastle more than 80 feet above the Witham at Tattersall. Soil, white clay, silt, or gravel. Drainage of town bad. Ample supply of two or three kinds of water from wells. No epidemics, except the severe one of diphtheria in 1859 and following years.

Lincoln.—The first year in which the records of the Lincoln Hospital became available for statistics was 1836.

Cases of intermittent disease admitted in—

	In-Patients.	Out-Patients.		In-Patients.	Out-Patients.
1836	2	None.	1856	4	1
1838	None.	1	1857	5	7
1839	1	1	1858	10	4
1846	1	None.	1859	7	11
1847	None.	5	1860	None.	5
1849	None.	2	1861	None.	None.
1850	3	3	1862	2	2
1853	None.	None.			

As many of these patients come from some distance around Lincoln, it would appear that ague is rare. This was confirmed by Dr. Torry, physician to the hospital and dispensary.

The general sanitary condition of Lincoln is very bad. I was informed that the "sanitary committee," formed of members of the Town Council, object to raise money for drainage purposes, and that little or nothing has been done for the improvement of the town since the publication of Mr. Giles's Report in 1849, in which it is stated that the drainage is very deficient, and that some privies and water-closets discharge themselves into small covered drains, which have their outlets into open channels in the streets. An increase in the population of late years has, of course, increased these evils. It is stated in the same report that an efficient system of deep drainage for Lincoln would be expensive and difficult to carry out.

A great part of the town is supplied with soft water from water-works outside the town; but many wells exist within the town, in several of which there is much reason to fear that the water is contaminated from sewage.

Despite this state of things, I could not learn that any epidemics attributable thereto had prevailed in Lincoln, with the exception of a considerable amount of typhoid fever three or four years ago.

Gainsborough.—The dispensary books showed scarcely any cases, and Dr. Mackinder stated that during the 10 years of his practice he had met with no cases arising in the district.

There is a Local Board of Health disposed to promote sanitary improvement. The town has been redrained, with outfall into the tidal river. The drains are used somewhat extensively for nightsoil, but as there are no means of flushing them thoroughly it appears doubtful whether the drainage in its present state is beneficial.

The water supply is partly from the river above the town, being raised by horse-power about low water, and partly from wells, the water of which is very hard from lime. Much rain water is used, even for cooking. There is much crowding of the population about the river banks. The cholera was very severe in 1849, but not in 1853. There has not been much continued fever.

Brigg.—Scarcely any ague in neighbourhood, except imported cases.

General sanitary condition of the town extremely bad. The town lies low, and there is no drainage worth mentioning. I visited the town with Mr. Moxon, union-surgeon, and saw several cases of typhoid fever in some filthy courts on east side of town. In one of these there was only one privy for 11 houses. On the west side of town a low lying portion known as "the Rookery" was one of the filthiest places I ever saw.

The water supply was formerly entirely from wells in the sock, which consists of gravel on the east and of silt on the west side of the town. The east side is now supplied with water laid on from Wrawby, except some of the courts. The north-west part of town is supplied by a spring from Castlethorpe. The south-west part, in which stands the Rookery, has no known satisfactory supply.

I could not ascertain that there had been any serious epidemic of typhoid, but there are frequently a considerable number of cases. Neither did I hear of any other serious epidemics.

The sanitary committee, formed of members of the board of guardians, are said to be opposed to any improvement, and to direct the inspector of nuisances not to report any case unless complained of.

Barton.—Mr. Morley, 27 years in practice, informed me that ague has not been endemic here since he came, but believes that it was rather common before the Axholme drainage was carried out.

I heard no complaints as to the sanitary condition of Barton, but was informed that the Local Board of Health, composed chiefly of farmers, have no byelaws, and shirk inquiry. There is abundance of hard water from wells.

Hull, including Sculcoates.—Cases of ague treated at the Hull General Infirmary since 1842. No record of previous years remaining :—

	In-Patients.	Out-Patients.		In-Patients.	Out-Patients.
1842	Probably none admissible until 1848.	4	1853	11	18
1843		7	1854	7	3
1844		4	1855	12	11
1845		2	1856	18	15
1846		4	1857	27	10
1847		10	1858	22	14
1848	6	17	1859	20	11
1849	15	15	1860	20	32
1850	5	11	1861	3	3
1851	9	8	1862	4	9
1852	10	9	1863	8	8

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The whole of these patients came from the vicinity of Hull and Sculcoates, excepting 15 in-patients, sailors from foreign parts, and 10 persons, of whom 9 were in-patients, from Holderness. From this it would appear that intermittent disease is not very prevalent in the district at the present time, a view confirmed by Sir H. Cooper who has practised for many years in Hull.

At the Sculcoates Dispensary I learnt that cases of ague had been very common many years ago, especially about 1826 and 1827, but much less so of late, only 10 cases having been entered in 1859, a year in which ague was so prevalent everywhere.

The district around Hull is flat and low, and the soil alluvial.

The agricultural drainage is difficult to carry out efficiently, and the same remark applies to the drainage of Hull and Sculcoates.

The Local Board of Health are now taking active measures to improve the drainage of these places, and for the frequent removal of nightsoil and other refuse within the borough.

Patrington.—The practitioner from whom I hoped to get information as to the amount of ague prevalent at an earlier date had died lately, but Mr. Dudley, union surgeon, stated that this disease is now rare, except amongst the inhabitants of Sunk Island, a low-lying district on the coast, about two miles south of Patrington. The land in the neighbourhood is well drained.

The general sanitary condition of the town is said to be good, and a committee of the board of guardians are now occupied with plans for improved drainage in it. There is an abundant supply of hard water from wells, but rain water is much used for cooking.

Goole.—Mr. Cass, union surgeon, 37 years in practice, stated that when he first came, intermittent diseases were very frequent but not often severe in form. He sees no well marked cases now, except imported ones, no accession having occurred even in 1858 or 1859, but intermitting tic and rheumatism are not uncommon. There was a great amount of ague in 1826.

Extensive drainage of the land in this district was effected about 40 years ago, accompanied by warping of the then peat land. The soil now consists almost entirely of warp, i.e., artificially effected deposit from the river with a subsoil of peat. The land is almost entirely arable.

The sanitary condition of the town is very bad. The surveyor for the Trustees of the Aire and Calder Navigation Company explained an extensive system of deep drainage, flushable from the docks into the river, but stated that it is very little used for nightsoil. The chief cause of the unhealthiness appears to be overcrowding, the result of a great increase in the population of late years without a proportionate increase in the number of houses. Many parts of the town are very filthy, and some new streets parallel to the Dutch River, built within a few years on leases for 99 years, are constructed on a very faulty plan.

There has been much typhoid of late years, and much zymotic disease prevailed at the time of my visit. Mr. Cass, who is also registrar of deaths, showed me many entries of deaths within the last few weeks from small-pox, scarlatina, typhoid, and typhus, and stated that the mortality from phthisis had been very high for many years.

The water supply is deficient and unsatisfactory; partly hard water from wells, partly water from the canal. Many persons use filtered rain water for cooking.

The increase in the population is the result of a great increase in the navigation to foreign parts.

Howden.—Ague appears to be almost unknown here. At the National School, average 120, the intelligent master, who had been there 37 years, informed me that in 1827 three or four children had been absent at once from ague, and he believed that the disease was common amongst adults at that time, when the drainage was bad. He has had no ague in the school for several years, and has only heard of one case in an adult.

The sanitary condition of the town is not good, there being several open drains containing nightsoil on the outskirts. There is not much overcrowding, however, and not so many Irish as formerly. There is a plentiful supply of hard water from wells. The only sanitary authority, the board of guardians, seem little disposed to take any steps for the improvement of the town. I did not hear of any serious epidemics having occurred here.

Selby.—Mr. Burkitt, nearly 40 years in practice, stated that when he first came intermittent disease was frequent and severe, especially in the villages round, but began to decline as improved drainage became general, and that ague is now almost unknown.

The present sanitary condition of Selby is very good. There is an excellent system of drainage adapted for the reception of nightsoil, and capable of flushing from the waterworks established about eight years ago. There are water-closets with ample supply of water in most houses, and the introduction of them into all is being insisted on, and there is a constant supply of good water laid on from the waterworks.

Cholera prevailed here in 1832 and 1849, but not in 1853.

Carlisle.—Ague not endemic here. In 1859, of 2,580 patients treated at the dispensary, only three were entered as suffering from intermittent disease.

The sanitary condition of Carlisle is good since the Local Board of Health, established in 1851, drained the town efficiently with an outfall into the river Eden. Since this, there have been no serious epidemics, except one of scarlatina, commencing about 1854, and continuing more or less for about three years. Dr. Elliot was inclined to connect this long continued prevalence of scarlatina with the introduction of street cabs about 1854, the bodies of children being frequently conveyed in them, and the epidemic ceasing when means were taken to prevent this. Water-closets are much used. There is an abundant supply of water from waterworks on the river Eden, the water being filtered by passing through gravel and sand.

Wigton.—No ague.

The town stands high on a subsoil of gravel. No artificial drainage. No sanitary authority except "Nuisances Removal Committee." Water partly from wells, which are frequently in contiguity with cesspools in the gravel. Water for cooking chiefly fetched from springs in suburbs. No rain water used for cooking. Population slightly decreased between 1851 and 1861, while number of houses slightly increased. Still overcrowding in some cases. Very little liable to epidemics hitherto, perhaps owing to good natural drainage.

Lancaster.—No ague in neighbourhood during a great number of years.

The sanitary condition of Lancaster has been much improved since the formation of a Board of Health in 1848. The drainage was extended in 1854, with outfall into the tidal river near the town, and including nearly all the nightsoil. There is a good supply of water from waterworks, which is about to be increased. The dwellings of

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the poor have been improved and increased in number, so that there is now less overcrowding.

In a report on the health statistics of Lancaster, addressed to the mayor, November 7th, 1863, by Mr. Grant, superintendent-registrar, it is stated, "The death-rate formerly averaged about 27 in 1000. I "never knew it below 26 prior to the execution of our sewerage and "waterworks. During the year ended March 31st, 1863, it was 22·7, "and in that ended September 30th, 1863, 22·2. These points are "lower than we have ever previously reached."

Mr. Metcalf Johnson, union surgeon, stated, that, with the exception of continued fever in 1862, the town has been remarkably free from epidemics. He had seen no case of diphtheria in 17 years practice.

Ulverston.—Mr. Dickinson, 30 years in practice, stated that there had been no intermittent disease, except imported cases, during his time; but he had heard from others that a good deal existed 60 years ago, which had diminished rather suddenly before much drainage was carried out, and while large tracts of land in the neighbourhood were still marshy. He could offer no explanation of this curious fact. The subsoil is chiefly gravel.

The drainage of the town is bad, especially of the lower part near the canal, which is seldom free from fever. The highway board seem little inclined to display any energy for the improvement of the drainage, though a comprehensive report on the subject was drawn up at their request by a surveyor last year. There is a good supply of soft water from the blue slate above the town, laid on from waterworks, but many of the lower people do not use this. There is also hard water from pumps, but some of these are suspicious from soakage. Hitherto, there appear to have been no serious epidemics attributable to the unsatisfactory sanitary condition of the place.

Garstang.—Ague not endemic. Dr. Bell, 40 years in practice, stated, that in 1826 and 1827 there had been some intermittent disease at Eccleston in this union, but not since. He sees a few cases of neuralgia, amenable to quinine.

There is no artificial drainage, but the natural drainage is good, as the town lies rather high, on a gravelly subsoil. There is a good supply of rather hard water from wells. No epidemics, except some scarlatina, had, I was informed, occurred here.

Lytham.—Dr. Gradwell, 33 years in practice here, stated that ague is not endemic in the neighbourhood. Previous to coming here, he had practised at Kirkham, and seen much ague when he first went there, having sometimes as many as 40 cases under treatment at once. It soon began to decline, however, before much drainage was carried out, a circumstance of which he could give no explanation. He did not recollect to have seen much neuralgia at that time.

There is a good system of drainage, including nightsoil, and few, if any, cesspools. The water supply is from wells at present, but an ample supply by means of waterworks from near Garstang is expected from June next.

The town appears to be very healthy.

West Derby.—Mr. Glazebrook, 20 years in practice, had not seen more than six cases in that time, and even those were probably imported.

He stated that West Derby has been pretty free from epidemics, except some cholera, and the district generally very healthy. The greater portion is well drained, either from Liverpool or by the railway company. There is a good supply of water from Liverpool.

Ormskirk.—Ague not endemic now, nor had there been much before extensive drainage was carried out in the neighbourhood.

There is a fair system of drainage for the town, with outfall into the brook, including much nightsoil. There are a good number of water closets, and the cesspools still remaining are emptied often. The waterworks supply abundance of soft water from the red sandstone underlying the town, with which the drains can be flushed. There is no overcrowding of the cottages, except in harvest by the Irish.

Rye.—Mr. Adamson, 40 years in practice here, had seen much ague of a well-marked character, chiefly tertian, when he first came. The disease is now much less common, and has assumed a remittent character, scarcely any cases of regular paroxysmal ague being met with now. There was a considerable accession in 1859, however, with one death in the cold stage.

The soil in the neighbourhood is chiefly clay, and much drainage has been carried out of late years.

The general sanitary condition of the town appeared good.

New Romney.—Mr. Wood, union surgeon, more than 30 years in practice, had seen much regular ague, with well-marked paroxysms, when he first came. The character of the disease has become much changed of late years, taking more the form of bilious remittent or even typhoid. The forms are altogether irregular, with peculiar perspirations, and sometimes with bloody stools.

The soil in the district is partly loamy, partly peaty, with a subsoil of sand or beach. The marsh was badly drained when Mr. Wood first came, but has been gradually much improved in that respect. Beyond this, Mr. Wood could assign no cause for the decrease in frequency and change in the form of intermittent disease in this neighbourhood.

The general sanitary state of the town is said to be good, though there is no deep drainage. There is no overcrowding, and there is plenty of good though hard water from wells. The town was stated to have been very free from epidemics.

Bexhill.—Mr. Wallis, union surgeon, 20 years in practice, stated that there was not much ague in this neighbourhood when he first came, and very little at present. The cases he now sees are mostly on high ground just on the borders of Pevensey Marsh, very few occurring in the marsh itself. Pevensey Marsh, the soil of which is loamy, is now well drained. The soil about Bexhill is clay, with a subsoil of gravel.

The town is well drained, and has a good supply of water from wells. It is generally healthy, and is said to have had few epidemics. The sanitary authority is quite inactive, and there is no inspector of nuisances.

Lewes.—Having heard that ague prevailed more or less in the whole district between Lewes and Newhaven, I visited the greater part thereof.

Mr. Saxby, a farmer who lives in the marsh district, stated that ague had been very common about 1826 and 1827, but that it had gradually decreased since then, although no great improvement had taken place in the land drainage of the district. He was of opinion that the circumstances and general health of the inhabitants are much improved. He alluded to the curious fact, mentioned in other places also, that persons who have never had ague while living here are sometimes attacked by it on going away to a non-malarious place. Mr. Turner, union surgeon at Lewes, with whom I visited the district, confirmed this.

The Rev. Mr. de St. Croix, 20 years incumbent of Glynde, has suffered much from ague, as have several members of his family, but less

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of late years. He had heard from the medical men that much well-marked ague existed in the district when he first came, but that irregular forms of intermittent disease had now taken its place. His own experience quite confirmed this.

Mr. Hother, union surgeon on Lewes side of the Marsh district, writes, "Intermittent disease is very prevalent in the parish of Bed-"dingham and in the country around. I find it more prevalent during "the hot summer months, and more severe than it is at other times. It "attacks chiefly the poor and ill-fed. The country around is low and "very marshy, there being much stagnant water in the numerous ditches."

Mr. Noakes, union surgeon on Newhaven side of the marsh district, writes, "We have now very little ague or intermittent fever. Piddinghoe "is as healthy as any of my parishes, and we have but very little "neuralgia. I attribute this to a better drainage of the land. The "river Ouse has been deepened, which, I suppose, has caused a more "healthy state of our neighbourhood, the last 10 or 15 years. I "believe Newhaven and its vicinity are as healthy as any part of "Sussex."

Piddinghoe, mentioned above, is a village near Newhaven, at which I had been informed that a severe form of ague formerly prevailed, not uncommonly quartan.

Neuralgia is still rather frequent in the district, but I heard of no cases of enlarged spleen or other abdominal complication.

A great portion of the district is scarcely above the sea level, the soil chiefly clay. There is but little deep tile drainage, and the ditches which form the chief drainage are badly kept.

Lymington.—Mr. Adams, 35 years in practice, had observed very little intermittent disease when he first came, but somewhat later there was a considerable amount of well-marked tertian. For the last 20 years he has scarcely seen a single case of ague.

Mr. Chinnery, union surgeon, stated that he meets with no ague now, even about Brockenhurst, which is very marshy. The soil about Brockenhurst consists of a thin layer of peat, with a very porous subsoil of sand or gravel.

The land about Lymington is now fairly drained.

The drainage of the town has also been improved of late years. About seven years ago there was much typhoid fever in the lower part of the town, near the river, the sanitary state of which was then bad. Since that time the town has been very free from epidemics of any kind.

The water supply is from wells, rather limited. The water is soft; that from some wells in the gravelly soil of the lower part of the town suspicious.

There are two sanitary authorities here, a committee of the Town Council and a committee of the board of guardians, each having an inspector of nuisances.

Christchurch.—Mr. Welch, 36 years in practice, had seen much ague from 1827, when he first came, until 1830, inland, in the low lands, on the banks of the Stour and Avon. It began to decline from 1831, but lingered somewhat longer on higher ground towards Lyndhurst, where a subsoil of clay underlies the peat. Since 1833 he has scarcely observed any intermittent disease in the neighbourhood, and cannot explain this decline by drainage in the low lands, where the subsoil is sand, as this has remained much the same. He believes, however, that the condition of the poor here is much improved, especially as regards their food.

The town is healthy, and was stated to have been free from serious epidemics. There is a good supply of soft water from wells.

There is no active sanitary authority or inspector of nuisances.

Bridgewater.—Mr. Hurman, union surgeon, stated that quartan ague is met with in the summer months, about the village of Chedzoy, about three miles north-east of Bridgewater, but not in the winter months, when the ground is flooded. On the whole he believed that intermittent disease is much less common of late years in the neighbourhood of Bridgewater since the land has been better drained, but neuralgia and rheumatism are still common, the neuralgia, however, readily yielding to quinine. He describes the soil about Chedzoy as clay of a very dense character, and peat, and says—"the drainage in "this parish is very bad, so intolerable that I have on two occasions "written to the Poor Law Board respecting it. Open drains, from "which flows the refuse of privies and pigsties, are, in six or seven "places, running across the main street of the parish."

Mr. A. Haviland, sugeon to the Bridgewater Infirmary and Cannington Dispensary, confirmed the statement that there is now little well-marked ague in the neighbourhood. In the Sanitary Review for 1858 he has described an epidemic of ague at Cannington, which village is situated about 2½ miles north-west from Bridgewater. In this paper he attaches unusual importance to deficient town drainage in the production of ague, a view in which Mr. Hurman seems to participate.

Mr. Axford, union surgeon, whose present district includes Cannington, believed intermittent disease to be much decreased of late years, and stated that the drainage had been much improved.

The records of the Bridgewater Infirmary showed no cases of ague amongst the in-patients (average about 230) for 1854 or 1855, three in 1858, four in 1860, two in 1861. No records of diseases amongst the out-patients are kept, and as the in-patients pay 8*s.* per month, probably only very severe cases of ague would apply.

At the Bridgewater National School, average 150, where very few of the children come from more than two miles distance, the master did not remember any cases, but believed that cases occur in other schools some miles off.

There is a good system of deep drainage for Bridgewater on both sides of the town, with outfall into the tidal river. The general sanitary condition of the town is good, except that in the flat portion east of the river there are several filthy and overcrowded courts, where some typhoid fever prevailed at the time of my visit. The inspector of nuisances was, however, actively engaged in endeavouring to remedy these evils. There is an abundant supply of good water.

Huntspill.—This is a village in the flat district between Highbridge and the coast. Mr. Poole, union surgeon, who has been 12 years in practice here, but had known the district for 26 years previously, from having practised in Bridgewater, stated, that this has always been an ague locality. He believed that there is perhaps rather more ague now than formerly, though it does not vary much. He has about 100 cases annually, chiefly quotidian, also from 40 to 50 cases of neuralgia, and much rheumatism and remittent and low fever, but no abdominal complications. He often sees children at the breast suffering from ague with the mother. He never saw a death in the cold stage.

The soil consists of clay many feet deep, and the land for the most part lies so low that drainage is difficult. Mr. Poole believed that little change has taken place in the drainage for many years, and pointed out to me several instances of slovenly farming, especially as regards the

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ill-kept ditches. The district is but thinly populated, and the people use ditch water to a great extent.

Bedminster.—Dr. Smart, union surgeon, 25 years in practice, did not remember two cases of ague during that time, nor does he hear from others of its occurrence in this neighbourhood. The drainage of Bedminster is bad, and cesspools chiefly in use. There is a good supply of water from the Bristol Waterworks.

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The cholera was bad here in 1859, and there is frequently some typhoid fever in the district, but there has been very little diphtheria.

Neighbourhood of Oswestry and Welshpool.—Mr. Peploe Cartwright, who has known this neighbourhood for many years, writes—

"We have no ague in this country. In 40 years I have only seen "three cases, and those occurred the year after the hot summer of 1826. "There may have been ague formerly between Oswestry and Shrews-"bury, and in the district of Llandrinio, but very many years ago."

Inquiries which I made as to the neighbourhood of Derby, Nottingham, and Leicester did not lead me to think it would be desirable to visit any of these places.

2. AMOUNT and SEVERITY of INTERMITTENT and REMITTENT FEVERS, and their consequences. Increase or decrease of late years.

It would appear from the foregoing inquiry that intermittent and remittent fevers and their consequences can no longer be regarded as seriously affecting the health of the population in many of the districts in which those diseases were formerly of a formidable character. Thus, in Norfolk, Lincolnshire, and Cambridgeshire, counties in which those diseases were both frequent and severe, all the evidence, except that furnished by the records of the Peterborough Infirmary and in a somewhat less degree at Spalding, tends to show that they are at the present time comparatively rare and mild in form. In several of the places visited, however, it was stated that accessions take place from time to time, and there was a striking agreement generally as to the years in which these accessions occurred.

The same holds good for the marshes in Hampshire, and for all the places visited on the west coast north of Liverpool.

In the south part of Essex, in north and south Kent, in the neighbourhood of Lewes and of Bridgewater, a somewhat greater number of cases occur than in the counties mentioned above, but these are rarely severe. Tertian is the form usually met with, quotidian less frequently, and quartan appears to be almost unknown. Instead of the well-marked paroxysmal ague, so prevalent in the marsh districts, an irregular form has succeeded, which interferes but little with the usual occupations of those affected.

Of the other consequences of malarious poisoning, neuralgia, chiefly of the head and face, is of somewhat frequent occurrence, but yields for the most part readily to treatment. Rheumatism of malarious origin is less common, while splenic enlargement is but rarely met with, and enlargement of the liver and dysentery, as results of the same cause, appear almost unknown.

It may, therefore, safely be asserted, as regards England generally, that the diseases which have been made the subject of the present inquiry have been steadily decreasing, both in frequency and severity, for several years, and this decrease is attributed, in very nearly every case, mainly to one cause, improved land drainage.

Confirmation of the reality of such decrease is afforded by the now rare occurrence of the cachectic hue of countenance, formerly so characteristic of the inhabitants of the fens; by the comparatively rare enlargement of the spleen or other abdominal complications, formerly so frequent, especially amongst children; and by the amenability of these affections to treatment.

Of the districts where malarious influence has of late times decreased, but where there still remains much to be accomplished in order that they shall be rendered free from malaria, the most important are Sheppey, Hoo, Spalding, Hull, New Romney, and Lewes.

Districts where, apparently, there has not been in late times much or any lessening of malarious influence, and where, consequently, all or nearly all the improvement has yet to be made, are Huntspill and the marshes on the banks of the River Swale.

3. IMPORTANT CHANGES OF THE LOCAL CIRCUMSTANCES.

The change of local circumstances unanimously declared to be the most important in influencing the prevalence of malarious diseases, is land drainage. Except in a few cases, in which medical men believed that these affections began to decline previously to the improved drainage of the places mentioned, the decrease, in all the districts where extensive drainage has been carried out, was stated to have commenced about the same time, and was unhesitatingly attributed to that cause. Great difference is, however, observable in this respect in connexion with differences in the soil. In the light peat soil of several districts where ague was formerly very rife, deep drainage has rendered the land almost too dry for agricultural purposes, and here the decrease has been most marked.

The reverse of this is seen in certain neighbourhoods, as that of Huntspill, where a heavy soil and deficient drainage exist together, and these appear to be the places in which malarious diseases may be expected to linger longest.

Intermediate between these two conditions is that of places where, although much moisture exists, the soil and subsoil are of a highly porous nature, as in the neighbourhood of Christchurch.

In some places, the introduction of ditches instead of hedges as boundaries of the fields, and the felling of much timber, were believed to influence the distribution of malaria, and to explain the appearance of ague of late years in more or less elevated spots, where it had previously not been known.

In several instances, improved circumstances of the lower classes, in reference to wages, food, and the state of their dwellings, were regarded as tending to diminish the amount of malarious diseases.

Lastly, where much pasture land had been converted into arable, the change was very generally regarded as tending to obviate the development of malaria.

4. SUPPLEMENT.

Coexistence of ague and typhoid fever, and of ague and goître in the same districts?—Very nearly all the medical men who had had opportunities of forming an opinion concerning the coexistence of ague and typhoid fever in the same districts, were of opinion that the local conditions which produce the former are favourable to the development of the latter. Thus Mr. Keddell, with 40 years experience in Sheppey, believed that when ague, from certain conditions of surface, is rife in summer, bilious remittent and typhoid fever prevail in autumn.

As regards goître, any evidence of its occurrence in the districts visited was so rare that it would seem that the conditions which produce malarious disease by no means necessarily tend to the development of goître. Thus, at Huntspill, probably the district amongst all those visited in which the greatest amount of intermittent disease at present prevails, Mr. Poole distinctly stated that no goître occurs. At Peterborough, during a period of 14 years, in which the occurrence of 4,000 cases of intermittent and remittent disease is recorded at the infirmary, only 20 cases of goître occurred, 15 of which are described as having been much relieved by treatment. Mr. Haviland, of Bridgewater, stated, that there is a tendency to goître and idiocy in the neighbourhood of Cannington; and Mr. H. R. Rump, of Wells, mentioned a damp valley near that place where goître is common, with some imbecility amongst those so affected.

Coexistence of ague and phthisis in the same persons?—On this point very few positive opinions were given, but several practitioners were inclined to think that there is considerably less than the average amount of phthisis in districts where ague prevails, the frequency of the former increasing as that of the latter diminishes. Few could call to memory distinct cases of such coexistence. One gentleman thought the phthisical disease appeared to be retarded in a patient with ague, and suggested that the congestion of abdominal viscera resulting from the latter might, by revulsion, check the activity of the lung-disease. Mr. Poole, of Huntspill, believed that the conditions which produce ague are certainly antagonistic to the development of phthisis, and stated that a very small number of cases of the latter disease occur in his neighbourhood. Dr. Paley (Peterborough) thought cases of such coincidence not uncommon, and believed the lung-disease to be rather accelerated. Mr. Cass, of Goole, had been struck with the increase of phthisis of late years, while intermittent diseases had become so much less common. The mortality from the former has been very high latterly there. Mr. Cass said, that when he came there nearly 40 years ago there was a popular prejudice in favour of sending phthisical patients into the district because ague was frequent.

Variations in strength of the morbific influence; from year to year; at different seasons of the year; during different temperatures, different winds, different degrees of moisture, &c.?—The increased prevalence of malarious diseases in certain years is very striking. All those who were able to speak of 1826 and 1827 agreed that in both, but more particularly in 1826, great accessions occurred. Almost as general was the evidence in reference to 1859, and in a somewhat less degree to 1857 and 1858. These were dry hot summers. In the wet summer of 1860, on the contrary, it was stated in most of the places visited that very little ague had prevailed. To arrive at the true value of such year-differences, however, it would be necessary to ascertain how far the peculiarities of temperature, &c., were the same for all parts of the country. Thus, at Boston, so hot and dry a summer had not been known since 1862, as was strikingly shown by the fact that it had not been necessary to open the "grand sluice" for the purpose of letting off the freshes until a few days before my visit (November 9), while in the neighbourhood of Lancaster and Ulverston the summer was regarded as having been rather a wet one.

The spring, early summer, or autumn were the seasons mentioned as those in which ague is most prevalent. The want of unanimity of opinion as to which of these seasons is most favourable to the production of intermittent diseases may, perhaps, be dependent upon differences in the local circumstances as regards earth-surface, sub-soil, &c.

High temperature, long continued, without rain, was regarded as most productive of malaria in marsh districts. Under such circumstances, surfaces become exposed to evaporation which in ordinary years remain entirely under water. This was very generally considered as the most probable cause of the accessions of such years as 1826 and 1859.

Little importance appeared to be attached to the effect of winds, except as a vehicle of the miasmatic poison, or as favouring the development of an attack of intermittent disease by causing general depression of the system.

Differences in the state of the local earth-surface and sub-soil at times when malaria is most evolved?—Malaria was believed to be most evolved when extensive moist surfaces undergo a gradual drying process, accompanied by the decomposition of vegetable matter. The conditions necessary to produce this state of things are stiff soil or subsoil, whereby rapid drying of the surface is prevented, and a hot sun.

Predisposition to malarious disease; age, sex, habits; general sanitary circumstances?—Almost the only evidence concerning the predisposition to malarious disease according to age and sex was that furnished by the records of the Peterborough Infirmary. The accompanying table includes all the cases during a period of 14 years ending November 1859.

CLASS 1.—EPIDEMIC DISEASES.

NAME OF DISEASE.	TOTAL.	Males.	Females.	RESULTS. Cured.	March Relieved.	Somewhat Relieved.	Not Relieved.	Non-Attendance.	Dead.	Parish Paupers.	Too ill to attend.	AGE. Years. 0–1	1–2	2–5	5–10	10–15	15–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90	Not known.	MONTH WHEN ADMITTED. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Proportion of Deaths.
Chicken-pox	31	9	22	30	..	..	..	1	..	..	..	11 V	7 VI	11 III	2 II	..	..	.. I	..	..	..	..	..	..	..	1	2	3	3	3	2	4	3	1	3	3	3	0
Small-pox	153	70	83	136	..	..	..	..	17	..	..	11 I	15 XIV	26 XX	30 XIV	26 II	11 I	16 I	11	2	..	..	..	..	5	15	2	2	3	17	17	6	13	14	38	19	7	1 in 9
Scarlet Fever	458	200	258	399	..	..	..	5	53	..	1	8 XXI	50 XIX	140 VIII	151	44	13	14	10	3	..	..	..	..	16 II	27	32	31	16	45	49	42	45	28	43	67	33	1 in 8½
Hooping Cough	397	156	241	363	15	1	1	24	50	1	2	105 II	86 III	158 IV	28 IV	5 II	2 IV	3 VIII	.. V	.. I	..	..	..	..	10 I	50	34	29	32	30	19	25	37	39	37	32	42	1 in 8
English Cholera	241	100	141	231	..	..	..	3	7	..	..	15 III	12 IV	15 IV	8 IV	10 II	7 VIII	41 V	41 I	28 IV	28 III	15 II	9 II	5 I	7 II	6	6	6	1	4	8	23	40	77	46	24	0	1 in 34½
Asiatic ditto	66	32	34	23	..	..	..	..	41	2	..	..	3	4	8	4	7 I	11	12	4 I	8	.. IV	2	..	2	2	5	2	..	1	..	2	6	3	34	11	..	1 in 1½
Diarrhœa	2111	944	1167	1876	20	11	5	115	62	14	8	852 III	325 II	138	71	39	105 I	304 V	211 I	103 I	141	80	36	7	89	96	163	133	97	96	133	161	329	355	289	194	120	1 in 34
Dysentery	134	60	74	121	4	..	..	1	7	..	1	13 III	23	12	11	1	4 I	19	15	20	7	4 I	2	..	3	6	7	3	6	15	5	2	19	54	9	6	2	1 in 19
Influenza	1527	686	841	1433	12	9	..	55	6	7	5	214	166	255	105	51	75	170	150	117 I	108	53	12	3	48	202	190	252	166	132	97	88	54	41	54	87	155	1 in 254
Ague	2267	1093	1174	2173	4	2	..	81	1	2	4	23	73	176	304	289	430	491	261	135	76	41	8	..	60	68	90	220	293	382	881	269	181	135	109	71	70	1 in 2267
Irregular ditto	1723	558	1165	1588	24	12	6	82	..	5	6	10 IV	30 I	110 III	112 I	114 I	197 II	376 II	294 II	226 II	147 I	51 I	3	..	53	112	112	173	155	193	193	192	162	130	106	107	88	0
Continued Fever	1133	525	658	1074	3	..	..	70	19	8	9	26 I	58 IH	171 VII	167 II	93 VII	115 V	195 X	94 I	69 I	44 II	20 I	9	..	122	73	90	90	96	103	115	116	121	114	118	88	59	1 in 62
Typhus ditto	758	339	419	708	..	2	..	1	39	6	2	2 VI	10 X	24 V	35	28	23	44	19	10	3	3	3	..	554	7	5	35	23	11	25	159	262	114	65	41	11	1 in 19½
Measles	379	189	190	343	..	..	..	14	21	1	..	52	93	170	37	3	1	1	5	..	..	..	..	..	17	58	17	10	10	26	32	38	28	20	15	38	22	1 in 18
Purpura	25	10	15	23	1	..	..	1	..	..	..	..	..	1	7 I	6	3	1	1	2	..	2	1	..	1	2	1	3	3	3	3	4	1	..	2	1	2	0
Diphtheria	11	2	9	9	..	..	..	..	2	..	..	..	..	1	1	1	2	1	3	..	2	..	..	..	..	..	..	2	..	2	..	..	2	2	..	3	..	1 in 5
Total No.	11464	4973	6491	10470	83	37	12	453	325	46	38	842	952	1421	977	764	996	1687	1127	779	564	269	85	15	987	723	765	985	904	1063	1084	1131	1298	1127	968	792	684	1 in 35½

NOTE.—The Roman figures denote the number of deaths that occurred from each disease at the age mentioned at the head of the column.

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Nos. 13, 14. Residence in Marsh Districts.

13. Ague and other Malarious Diseases, by Dr. Whitley.

13. Ague and other Malarious Diseases, by Dr. Whitley.

The general opinion, however, appears to be that men suffer more than women, though this is only attributed to the circumstance of their being more exposed to malarious influences. The comparative infrequency in very early infancy and in advanced age shown in the above table was borne out by most of the medical men whom I questioned on the subject. As regards general sanitary circumstances, any depressing influence, such as intemperance, bad food, deficient clothing, or unhealthy dwellings, appears to favour the development of malarious disease. On the other hand, where any considerable improvement had taken place of late years in the condition of the inhabitants, such improvement was regarded as an important element in the decrease of those affections.

Period of incubation of malarious fever, and relation of this period to post-determining circumstances?—None of the medical men being able to define the period of incubation of malarious fever under ordinary circumstances, all the evidence to be obtained on this point was confined to the belief, which was very general, that depressing influences to which a person who had been exposed to malarious poisoning became subjected, would tend to shorten such period, or determine an attack which might otherwise never have occurred.

Do primary and subsequent attacks of malarious disease usually occur at the same season of the year?—In four or five cases only was any positive opinion offered on this point, and in all of these the answer was in the affirmative.

What influence is exercised by malarious poisoning over the type or course of non-malarious diseases?—In places where ague still prevails, or had prevailed within the experience of those questioned, it was very generally stated that many diseases, especially those of an acute or febrile character, assume, after the first severity of the primary disease is over, an intermittent character. The exacerbations occur, for the most part, every other day, in accordance with the form of malarious disease most frequently observed, the tertian. Convalescence from other serious diseases appears to be retarded by malarious poisoning.

What results arise from drinking the water of marshes?—Dr. Paley stated that there is a form of severe dyspepsia common in aguish districts, but it is doubtful whether this results from drinking the water of marshes. It is amenable to quinine.

Mr. Muriel, of Ely, said that sickness and gastrodynia are frequently met with amongst the inhabitants of marshy districts, while diarrhœa is much less common. Some medical men even thought that the water of marshes may be drunk with impunity, while very few appeared to think that any very serious consequences arise from drinking it.

14. Excessive Mortality of Infants, by Dr. Hunter.

No. 14.—REPORT by DR. HENRY JULIAN HUNTER on the EXCESSIVE MORTALITY of INFANTS in some RURAL DISTRICTS of ENGLAND.

The annual mortality of infants under one year throughout England and Wales has been discovered from tables founded on an estimated population between the years 1851 and 1861 to have been at the rate of 17,731 in 100,000 living at that age. The rate varies very much; and as might be expected from the habits of the people, and the general mortality at all ages, the infantile mortality is seen to be higher in the large towns than in the country districts. The rate, for instance, in Liverpool is so high as 27,703, in Coventry 27,557, in Leicester 23,309, and in Sheffield 22,600. Also in those black mining countries, which are neither urban nor rural, but where the same influences were known to prevail, the rate is high, as at Crickhowell, 22,757. What those influences are, and how their action is directed against infantile life in particular, have been the subjects of reports to the department, all of which seem to point to the undue employment of the mothers as the real cause of the excessive mortality.

If the rural countries be turned to, it will be found that throughout the three pastoral districts of Bellingham, Glendale, and Rothbury, where there is a minimum of female labour, the lower average rate of 8,000 prevails. Indeed the rate of the whole northern counties is but 16,906, but on the other hand it is apparent that some few of the thoroughly rural districts, having no extraordinary mortality at all ages, and no factories whatever, still have an infantile mortality which is equalled by a few only of the large towns.

If those districts distinguished by high infantile mortality, not to be explained by the presence of factories or mines, be selected from the

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list, it is found that those in which the mortality is above 20,000 in 100,000 infants living at the age are but the centres of a large country in which the rate is above the English average, and lie in five districts or clusters of districts which are shown coloured red in the accompanying map. It is seen that they all lie on or near the mouths of the large rivers pouring into the North Sea.

14. Excessive Mortality of Infants, by Dr. Hunter.

1. At the point where the Ouse, Aire, Don, and Trent meet to form the Humber estuary, the three Districts of Howden, Goole, and Thorne have an infantile death rate respectively of 22,375, 21,815, and 20,744.

Location of mortality.

2. Around the Wash, a large part of Norfolk, Lincolnshire, and Cambridgeshire is involved in the same character, together with the banks of the Lower Ouse, Nene, Welland, and Fossdyke. This area contains the following Districts:—Wisbeach, 26,001; King's Lynn, 22,561; Ely, 22,016; North Witchford, 22,601; Downham, 23,106; Whittlesey, 23,772; Walsingham, 21,778; Docking, 22,273; Spalding, 21,845; Holbeach, 23,495; and Freebridge Lynn, 19,606.

In Freebridge Lynn the mortality does not exceed the 20,000. King's Lynn contains a large town, but there is no manufacture nor other reason for removing the district from the list.

3. A third country consists of the mouths of the Wensum, Yare, Bure, and Waveney, containing the districts of Yarmouth and Mutford. Yarmouth has an infantile death-rate of 22,846; it is, however, a manufacturing town, containing a silk mill, and many women employed in net making. If it stood alone, therefore, it might, like Norwich, which itself presents an infantile mortality of 23,517, be excepted from the present inquiry; but with Yarmouth is included a small rural area adjoining the rural district of Mutford, which last has a mortality of infants of 21,101.

4. A fourth scene of infant death is inland, but, except the parishes of Buckenham, scarcely above the level of the sea; Wayland 20,711, and Guiltcross 21,508, are mostly low fenny districts, lying in the middle of East Anglia, and are of no great extent or population.

5. The fifth is the small district of Hoo on the Medway, opposite Chatham, which has the infantile death-rate 24,452.

It is evident that the most important natural character common to these districts is their lowness and flatness; but as this peculiarity gives no explanation of the form of mortality, it was thought necessary to inquire in each district of the persons who were most able to afford a valuable opinion what there was in the nature of the soil and climate, or in the habits of the people, which could account for such sad destruction. For this purpose, in the latter part of March 1864, all the districts, with the exception of Hoo*, were visited, and the opinions of about 70 medical practitioners, with those of other gentlemen acquainted with the condition of the poor, were obtained.

With wonderful accord the cause of the mortality was traced by nearly all these well-qualified witnesses to the bringing of the land under tillage, that is, to the cause which has banished malaria, and has substituted a fertile though unsightly garden for the winter marshes

* With regard to Hoo the inquiry was made by letter, and elicited from Mr. Wright, the surgeon of that place, the following statement:—"From nearly five years experience as medical officer, I have found that the infantile mortality arises from the following causes:—

1. The major part of the female population are engaged in field labour, the children are consequently artificially fed and greatly neglected.
2. A great number of premature births take place through field labour.
3. Infusion of poppies, opium, and its preparations are administered to a very large extent.
4. The high rate of bastardy and the scarcity of cow's milk are subordinate causes."

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Female labour.

and summer pastures of 50 or 100 years ago. It was generally thought that the infants no longer received any injury from soil, climate, or malarious influences, but that a more fatal enemy had been introduced by the employment of the mothers in the field.

It appears that the land in these districts is generally light, and that the recently reclaimed "black lands" are very light indeed, and may be submitted to women's work to a far greater extent than anywhere else in the kingdom. The crops also for which these lands are best fitted, as for instance the great potato crop of the Upper Humber, are such as afford an amount of employment to women unknown elsewhere. The eradication of twitch is also a branch of women's work. The women's wages vary in localities and seasons, and also with their strength and aptitude, from 8*d.* to 1*s.* 8*d.* a day, and for such work as they can do they are often preferred to men, because of their superior industry and order. A party of women will often come from several miles off to work at a village in which numbers of men are unable to get work at all. One source of profit in the employment of women is the superior management and consideration they show in combining their work with that of boys and girls, and this quality has led to the frequent formation of what are called "gangs" of women and children, who work together for a stated sum paid by the farmer to a man called the undertaker, who contracts for the whole gang. These gangs will sometimes travel many miles from their own village; they are to be met morning and evening on the roads, dressed in short petticoats, with suitable coats and boots, and sometimes trousers, looking wonderfully strong and healthy, but tainted with a customary immorality, and heedless of the fatal results which their love of this busy and independent life is bringing on their unfortunate offspring who are pining at home. By these means all the pasture is disappearing from the lowlands, and its place is being supplied by arable land. The women pick up stones, spread clay, hoe, weed, or take up potatoes. Land which has been under tillage for many years is now, through their means, made to bear such a frequent succession of remunerative crops as can only be obtained with plenty of labour. The county of Cambridge, for instance, has really very much more cultivated land than it had 20 years ago, and yet the rural population has diminished. The same to a less extent is the case with the county of Suffolk; and in these two counties the women, who, as is reported, used, while sitting at home, to suffer much from rheumatism and colds, now supply the labour, enjoy the health, and receive the wages of men, with advantage to all except the children who are too young to join the gangs. It is to their fate that attention was particularly directed.

Miscarriage.

In looking over the register books of deaths in these Districts the eye is immediately caught by the high number of baby deaths reported to have been caused by premature birth. A medical gentleman at Ely and others thought this term was used unduly and to a wide extent; that few children died in the first few months of life without it being said that they came before their time. There were, however, numerous cases related of labour coming on in the harvest field; and it may be fairly presumed that some of these premature births, succeeded by premature death, were the effect of field work; for a search of the books proved that by far the greater number of them took place in the summer quarter, and it is not difficult to suppose that the exposure of the pregnant mother to the heat of a 12 hours summer's day, without an inch of shelter from hedge or tree even at dinner time, and far away from her own home, will cause some part of the miscarriages which the books report to take place. Less directly, but not less

certainly, does the field work induce premature birth through bastardy. The immorality caused by the gang system has caused it to be put an end to in many parishes, and it is universally reprobated by those who are independent of its profits. It is said to account for the high number of illegitimate births in the counties involved. Attempts to produce premature birth on this account were reported, though they were not known to be very common. A French woman was said to have done a great deal of mischief in this way at Wisbeach; and a notion the young women have that such drugs as savine or turpentine will induce miscarriage leads them to take large quantities, from which, although they are usually disappointed of their wishes, may be expected a diminished vivability of the child. It was stated that an ague pill in use in North Witchford sometimes caused premature birth.

The illegitimate births frequently occur in the workhouse, and here, until the child is taken out, it thrives as well as others, but within a few weeks after their discharge the mother will go to the registrar, to inform him that her child is dead, and that it was always weakly and never "likely for life." The lawful child fares little better when the mother belongs to a gang, or even does ordinary field work in her own parish. In the agricultural population it may be roundly stated that of the illegitimates one third die under a year old; of the others one-fourth part. Then it must be remembered that in the latter class, who form nine tenths of the births, are found nearly all those of people whose comfortable circumstances allow them to give proper time to nursing their children. Bad nursing.

The years most fatal to children were not found to be those in which ague was most prevalent; and it was only in two or three instances that medical practitioners thought the children suffered from any splenic or other disease the effect of malaria. Very seldom had the body of an infant been opened, and contradictory results attended the few inspections. Bronchitis and pneumonia were common in the registers on the north-coast of Norfolk, but unusually rare elsewhere. Mesenteric disease was frequently recorded, but, as most of the surgeons said, was rather suspected than known to exist. The diagnosis of infantile disease seems to be considered difficult and unimportant. In the same village two practitioners recorded long lists of deaths of infants, the one almost exclusively certifying mesenteric disease as the cause of death, the other attributing nearly all his cases to cerebral diseases. But, with hardly an exception, all stated, that under whatever late symptoms the death was recorded, the real cause of half of them was the mother's neglect. The degree of criminality attributed to the women varied, from a sympathizing excuse for their ignorance to a downright charge of wilful neglect with the hope of death,—in fact infanticide.

It may be easily understood that these degrees of criminality must be infinitely various. A poor girl, brought up in a gang, seduced in the field, and afterwards suddenly taken there in labour, will bring in to a family a child for whom no provision has been made, and where it is most unwelcome. She is called away to work as soon as she is able, and it comes to her as a matter of course that she should leave the child to the old woman who professes to keep a school for such babies. The mother gives suck on depositing the child in the morning, and again on her return home. She, after carefully drawing and throwing away the first milk, gives the child its evening meal. She is too tired to fail to sleep through the night, and indeed she cannot afford to lose her rest. Both by day and night, therefore, is the child either deprived of food, or fed, not with a bottle but a spoon, and it soon acquires a taste for the unnaturally solid food given it. Cow's milk is dear, and often quite

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unattainable by these people, and sugar sop, a lumpy mass of bread, water, and sugar, is given instead. This is either given cold, or is left on the fire hob in a cup, seldom or never changed or cleaned, whence the fermented and sooty mass is heaped into the infant's mouth by the nurse, who prefers this mess to cows' milk, under the notion that "the two milks could never agree."

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A worse degree of criminality is found in older mothers. After losing a child or two, they begin to view the subject as one for ingenuity and speculation. It is related that on the birth of a second or third bastard the neighbours will say, "So and so has another baby; you'll see it wont live;" and that this becomes a sort of joke, in which the mother will join, public opinion expressing no condemnation of her cruelty. A medical man is called to the wasting infant, "because there is so much bother with registering." The mother says the child is dying, and won't touch food. When he offers food the child is ravenous, and "fit to tear the spoon to pieces." On some of the few occasions on which the surgeon in his disgust has insisted on opening the body the stomach and bowels have been found quite empty.

It was in many places reported that infant life had been saved in the midst of one of these wastings by the threats of a determined surgeon or neighbour. Where the coroners have been induced to support these attempts to save life, where inquiry has been made, and severe admonition, with an appearance of a chance of committal, also where the registrar has pretended to refuse registration without medical certificate in families notorious for their loss of infants, in these cases an amendment has taken place. It was more than once related that women who had lost two or three successive children lost no more after it had been plainly signified to them that their proceedings were watched.

Opium.

Bad as is this starvation of infants, another practice is more common and more lethal; this is the drugging with opium. There is nothing in the soil, the climate, nor in the prevalent diseases of children, which calls for the more free use of this drug than is common in the rest of the kingdom. Malarious dysentery is unknown, and there is no suspicion that the whining infants are suffering from rheumatism or neuralgia. The common diarrhœa, moreover, is but the effect of bad food. Still there can be no doubt of the truth of the horrid statement made by almost every surgeon in the marsh land, that there was not a labourer's house in which the bottle of opiate was not to be seen, and not a child but who got it in some form. In other countries, where women work away from home, as in the factory towns, the children are drugged by the nurses, and one need not be surprised to find the same plan adopted here; but other circumstances combine to render it a common practice to push this drugging system to an extent known only in the districts in question.

Familiarity of the people with opium.

The painful rheumatisms and neuralgia which still continue to be common in the fens have been generally treated by the free use of opium, and with this drug the whole people have become thoroughly familiar. The wholesale druggists report that they send immense quantities to these countries, and the retail druggists often dispense so much as 200 lbs. a year. It is sold in pills or penny sticks, and a well-accustomed shop will serve 300 or 400 customers with the article on a Saturday night. The druggists thought their largest consumers were not the villagers, or people of the little town in which the shop was, but rather the inhabitants of small hamlets or isolated farms in the fens. Opium is often asked for under some cant name, and the idea of it is as of a forbidden jollity. The quantity which an old opium eater will take has often been reported (about half an ounce a day is common),

and finds its limit rather in the cost than in the strength of the drug. A man in South Lincolnshire complained that his wife had spent 100*l.* in opium since he married. A man may be seen occasionally asleep in a field leaning on his hoe. He starts when approached, and works vigorously for a while. A man who is setting about a hard job takes his pill as a preliminary, and many never take their beer without dropping a piece of opium into it. To meet the popular taste, but to the extreme inconvenience of strangers, narcotic agents are put into the beer by the brewers or sellers.

Half a century ago the growth of poppies for the London drug market was conducted in this light land. Then the husbandman took poppy drink with him to the field; and now, although the cultivation of the article for sale is almost abandoned, the poppy capsule forms the principal ingredient of the herb teas and domestic medicines of the neighbourhood.

With such familiarity with the drug, no wonder that every one is ready to use it to quiet a crying child, though only to ensure its crying again as soon as awake. Opium eaters are said to be always proselytizers, and will even give a child opium behind the back of the mother or nurse. The favourite form for infants is called "Godfrey's Cordial," a mixture of opium, treacle, and infusion of sassafras. This is thickish, and is often fetched in a tea cup. When the mother going to field work deposits her child with a nurse, she thinks it best to leave her own bottle of "Godfrey," because the preparations of the different shops vary, and there is not a little village shop in the country that sells anything that does not sell its own Godfrey. To push the sale of opiates in these little shops is the great aim of some enterprising wholesale merchants. By druggists it is considered "the leading article," and the profit on it is small when sold in a crude state. It has not unfrequently happened that a nurse has substituted her own Godfrey for her clients, and, frightened at its effects, has summoned the surgeon, who finds half a dozen babies, some snoring, some squinting, all pallid and eye sunken, lying about the room, all poisoned. The surgeons have a means of pouring solution of sulphate of zinc through a catheter into the stomachs of babies, which ought to be known elsewhere.

The Godfrey seems to be made by rule of thumb, and is treated as carelessly as if the most harmless drink in the world. A small teaspoonful, that is about 40 minims, is the maximum dose of *laudanum* given to children under one year.

Cases of death from opium poisoning are supposed to be common; occasionally they are the subject of inquests; sometimes they are recorded as cases of "overlying;" but the medical practitioners are of opinion that by far the most common end of such cases is the simple registration and burial as cases of "*Debility from birth, no medical attendant,**" "*Premature birth,*" and such like, the public opinion of the neighbours seldom going beyond a sneer or sarcasm on the occurrence of a quarrel months or years after.

It is not suspected that any other drug is largely administered or other means of getting rid of children adopted than those mentioned.†

But a great many cases of infantile death are certified by medical practitioners as caused by *atrophy, tabes, marasmus,* &c. The attendant is usually here ready to admit that the primary cause was the general bad nursing; and that it was the use of opium which did the most mischief. Surgeons who are used to this country know an opium eating

* At Attleborough 68 such entries out of 500 deaths.

† See note on Snettisham.

baby at once; they are brought to him wasted, but without apparent organic disease, and without other symptoms than wasting. Some said they "shrank up into little old men;" others they "wizzened like little monkeys;" but none were willing to certify to any cause of death which would inculpate anybody, and each surgeon preferred the doubtful course of certifying the advanced symptoms as the cause of death. At the same time they frequently complained of the facility which they thought the coroners and registrars allowed for the concealment of the real cause of the infantile deaths. Until a series of careful examinations after death be made in these districts, the cloud of uncertainty which hangs over the pathology of the great cause of death which appears in the register book under these terms will not be cleared away. Some of the children were described as potbellied; others as emaciated in the abdomen as elsewhere; in none was any peculiar complexion or peculiar excretion observed. Some surgeons had thought they had detected mesenteric disease, and some one or two had known the spleen to be hardened: but everywhere disease, whatever it might be, was considered as a merely subordinate agent to starvation and drugging.

The "living skeleton," who travels from fair to fair, was a native of the fens, and the union surgeon who attended him as a child said that his emaciation was caused by continued administration of Godfrey. On the other hand, Mr. Maynard, of Wisbeach, who had seen the ague-stricken districts of Asia, related that the Asiatic children, in whose pot-bellies the enlarged spleen could be easily recognised, were generally excessively fat.

Minor causes.

Other minor causes of death were occasionally put forward. It was said that the children were often laid on brick floors saturated with water. That a "tasteless ague drop,"* containing arsenic, was formerly given to children who suffered from ague, but this was not in use at under one year of age. At Chatteris, marriages of consanguinity were said to have been very general. The hardness and sometimes saltness of the water is injurious to some little extent, but it is obvious that a well-nursed child requires little or no water at all. The dearness of cows' milk has been alluded to; it is sometimes 4*d.* a quart, but more often cannot be got at all, the destruction of the pastures having sent the cowkeeping farmers on to the higher districts.

In Yorkshire only was it supposed that burial clubs or life assurances operated to the destruction of the infants. In this county it seemed more usual to give the baby a dose of opium, and to leave it at home with the other children, than to give it in charge to a professional nurse. Laudanum was until very recently issued as rations to the old people in the Yorkshire workhouses by order of the guardians.

Besides the wholesome restraint which the personal action of the clergyman, the surgeon, the coroner, and the registrar may put upon the wilful or negligent infanticide prevalent in their respective districts, there appear to be two measures of public police which afford a hope of remedy for this wicked state of things. One is the establishment by the Poor Law officials, or by private benevolence, of an infant nursery, where a responsible nurse, liable to medical and other supervision, may receive and tend the infants. This might be done in every village of more than a hundred houses throughout the ganging district. Another remedy would be the imposition of a license on all sellers of opium.

* Said at Snettisham to have been fatal to several children, and in the last death book of that subdistrict, 4 per cent. of the entries were caused by sore mouth, with a great many "low fevers" of children. Throughout the Docking and Walsingham districts adverse influences of climate and soil could also be traced in the register of cause of death.

The effect of this would be to limit the sale to the larger shops, where the quantity sold makes it worth while to pay for a license, and where more competent assistants are kept than are found in the village general shops. The numerous varieties of strength of the opiate, and the carelessness in its preparation, would be got over by this measure; and the interposition of a little difficulty, such as the distance the drug would have to be fetched, and the enhanced price, would do no harm if it diminished the amount of consumption.

So perfectly did the main body of medical practitioners agree in the opinion that "ablactation and narcotism" would be the true description of the cause of death of more than half the infants recorded, that a list of their names seems to be all that is necessary to be added.

Ely: *

Littleport, Mr. Herring, Mr. Mackintosh.

Ely, Dr. Pearson, Mr. Jones, Mr. Muriel, Mr. Coles.

North Witchford: †

March, Mr. O'Connor, Mr. Wray, Mr. Wray, junior, Mr. Wright, Mr. Cullege.

Chatteris, Dr. Farrer, Mr. Wright, Mr. Newham of Doddington.

Whittlesey:

Mr. Crisp.

Wisbeach: ‡

Mr. Ollard, Mr. Wales, Mr. Groom, Dr. E. Bury, Dr. Maynard, Dr. J. C. Bury.

Lynn: §

Mr. Kendall, Dr. Hunter, Mr. Smythe, Mr. Allinson.

Yarmouth: ‖

Mr. Bayley, Dr. Stephenson, Mr. Smith.

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* Ely District:

Haddenham book of 500 deaths showed 136 under one year.

Littleport book of 500 deaths showed 167 under one year, of whom 55 died of atrophy, and 46 under one month. Another book of same subdistrict showed 172 infantile deaths, and no less than 42 ascribed to premature birth.

Sutton, under one year 161, of which the premature births caused 22, and congenital disease 67.

† North Witchford:

March, under one year 158, atrophy 61; under one month 55, premature 25. In Mr. Lee's Report on March to the General Board of Health in 1851, evidence will be found of the habit of opium eating, and on the system of ganging.

Chatteris, of 17 prematures, 12 occurred in July, August, September, and October.

‡ Wisbeach:

Entries under one month tending to show the unity of all the causes:

Walsoken, prematures 35.

Walpole, prematures 5, debility 19, exhaustion 0.

Upwell, prematures 5, debility 1, exhaustion 16.

§ "The town of Lynn, at the time when Mr. Lee inspected it [for the late General Board of Health] in 1853, received an atrociously bad character from its medical residents. Dr. Whiting, one of the gentlemen who gave evidence, said, 'I must beg 'leave to say, that I think a great deal of the disease in this town originates in de-'bauchery and drunkenness; debauchery principally, but drunkenness to a great 'extent. Prostitution is carried on to a greater extent than in any town I have 'lived in.' Further on, the witness stated that poisonous drugs, especially opium, was largely used, and the production of abortion was a common offence."

Dr. Richardson, in the Medical Times.

‖ Yarmouth has a silk mill. In visiting it I found that a low temperature of 58° to 60° was there preferred, except for some special processes, which sometimes required even 70°. There were consequently no heat pipes, and when the rooms were cold the gas was lighted. The rooms were low, and apparently not easily ventilated.

The privies were water-closets. Water was raised to the roof by steam-power, on purpose to supply these closets, inattention to the rinsing of which was prevented by the principle of attaching the valve system to the opening or shutting door. The

MUTFORD :
Gorleston, Dr. Arnett.
Lowestoft, Mr. Worthington, Mr. Clubbe, Mr. Ray.
(In Mutford the bad nursing was vehemently condemned, but some of the surgeons thought the narcotizing was not unusually prevalent.)

WAYLAND AND GUILTCROSS :*
Mr Wiles, of *Attleborough*, Dr. Ellis.

WALSINGHAM : †
Fakenham, Mr. Damant, Mr. Drew.
Wells, Mr. Vincent.
Walsingham, Mr. Bayes.

DOWNHAM : ‡
Mr. Wales, Mr. Macintosh, Dr. Johnson.

DOCKING :
Snettisham, Mr. Davis.

SPALDING :
Dr. Morris, Dr. Stevens, Dr. Cammack, Dr. Stiles, Mr. Elsdale of *Moulton*.

HOLBEACH :
Mr. Wise.
Long Sutton, Mr. Ewen, Mr. Ewen, junior, Mr. Metcalfe.

GOOLE :
Snaith, Dr. Hanks, Dr. Hodgson, Dr. Thompson, Mr. Macaulay of *Rawcliffe*.
Goole, Mr. Cass, Dr. Johnston.
Swinefleet, Mr. Faulding, Mr. Savage, Mr. Haldenby of *Reedness*.

HOWDEN :
Mr. Tireman, Dr. Baker, Dr. Grieve.

THORNE : §
Crowle, Mr. Phineas Ellis, Mr. H. Ellis, Mr. Trousdale of *Epworth*.
Thorne, Dr. Littlewood, Dr. Gooddy.

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system, though obviously expensive, seemed efficient. Silk was sometimes thrown in, and obstructed the passage. There was a grating in the main drain to catch any silk which might be passed down.

* GUILTCROSS :
Banham, of 500, 44 did not live a week.
Kenninghall, of 500, 44 did not live a week.

WAYLAND :
Attleborough, 113 bastards in 842 births. Of 68 deaths from "debility from birth," 21 were bastards.

† WALSINGHAM :
Wells, of 208 births, 21 were bastards.
of 454 deaths, 108 were under one year.

‡ DOWNHAM :
Downham, 500 births, 39 bastards.
500 deaths, 132 under one year.
Fincham, 500 births, 52 bastards.
500 deaths, 112 under one year.
Wiggenhall, 500 births, 30 bastards.
500 deaths, 148 under one year.
At Wiggenhall were five successive entries of deaths from "unknown" causes "no medical attendant," in young babies, occurring on the 3rd, 5th, 7th, 15th and 18th of July 1857.

§ THORNE DISTRICT :
Per-centage of bastards, *Thorne* 10·6, *Epworth* 5·6, *Crowle* 6·2.
In Thorne sub-district it was odd to find an infant death at three weeks' old registered "orchitis, certified." Of the 500 last deaths, 58 were convulsions, and 28 atrophies of infants. There were but few other causes reported.

No. 15.—Report by Dr. John Syer Bristowe and Mr. Timothy Holmes on the Hospitals of the United Kingdom.

Introduction.

The commission with which we were charged, and which this Report is intended to fulfil, is thus expressed in our letter of instructions from the Medical Officer of the Privy Council: "to ascertain "the influence of different sanitary circumstances in determining in "different hospitals (as compared with one another, and, where practi-"cable, with private practice,) more or less successful results for "medical and surgical treatment; particularly among patients who "are submitted to surgical operations, or have undergone accidental "injuries, and among patients suffering from infectious fevers and "other kinds of acute disease, and among puerperal women, and with "particular reference to the different degrees in which recovery is "delayed or prevented by accidental morbid complications." *

Under the term "Sanitary circumstances" we have held the following to be included:—

1. The regulations of hospitals with respect to the admission of patients, to the kinds of disease admitted or excluded, to the separation or admixture of different classes of disease, to the class of patients admitted, and to a few other minor particulars.
2. The construction of hospitals, with respect to the general arrangement of the building, the arrangement of the wards, and the disposal of such other parts of the building as can be supposed to affect perceptibly the health of the patients; and also with respect to their site.

To each of these subjects we have devoted a section in the ensuing Report. And in order to exhibit the bearing of these particulars upon the question proposed, we have discussed the general topic of the health of hospitals in a separate section.

Regulations of Hospitals.

In searching for an answer to the question proposed to us, viz., "What sanitary circumstances determine, in different hospitals, more "or less successful results for medical and surgical treatment?" we have been led irresistibly to the conclusion, that the chief cause of all the differences, real and apparent, which exist between different hospitals, is to be found in the constitution of the hospital itself. We shall endeavour to give some approach to an estimate of the advantages to a hospital of country situation, of the class of patients admitted, and of the construction of the building, but we rate as more important than any or all of these, the regulations which determine the admission of patients.

In comparing the hospitals of Paris with those of London, and these again with those of small country towns in England, nothing strikes

* Letter dated April 1, 1863.

the observer so much as the entire and radical difference of constitution and object between these several institutions. The hospitals of Paris are government establishments, having, it is true, property of their own, but not sufficient to maintain them on their present scale, and therefore looking to the government for what they require beyond their own revenue. The government consequently demands that they shall receive all the sick poor of the department, who would otherwise become a charge upon the public or be left to perish. Every one, therefore, who is poor enough, and sick enough, to require admission into a public hospital, is sent by a public officer into any one of the hospitals in which there may happen at the time to be a vacant bed for him; and, even if there were no vacant beds, additional beds would be placed in any hospitals that the central administration might choose. Therefore the accommodation which the hospitals of Paris furnish, that is to say, the number of beds in each of them, is regulated chiefly by the wants of the district in which the hospital is; since, unless the requisite number of sick can be accommodated in the hospital belonging to their own quarter of the town, either a new hospital must be built, or all the inconveniences and dangers of transporting the patients to a hospital at some distance must be encountered.* But more than this, the hospitals must also receive all the cases of urgency which occur, and of course in the proportion in which they occur. Consequently no disease is excluded; and the proportion of acute medical to acute surgical cases is something like what really exists amongst the class from whom the hospital population is drawn. Again, the government has wisely determined to economise its hospital resources as much as possible, by withdrawing from hospital all those patients who are well enough to leave with safety, so that large convalescent asylums (at Vincennes for men and at Le Vesinet for women) receive those who are able to be removed, and thus leave the hospitals free for the treatment of cases of greater urgency.

In London, on the contrary, hospitals are private institutions, and receive only such cases as the governors of the hospital choose to admit†. Several of the largest and oldest hospitals have large realised property sufficient for their support, and even for their extension; others have more or less ample property, eked out by donations and subscriptions; others are entirely dependent on casual private liberality. Hence a radical difference between London and Paris hospitals. In London, such rules as are approved by the governing body fix what cases each hospital shall receive, and these regulations differ for each hospital. None of our general hospitals receive small-pox. Most of them exclude scarlet fever and measles. Several exclude, by rule, all cases of fever.‡ The number of beds is also fixed solely acccording to the salubrity or convenience of the hospital, and not at all by the wants of the district. The beds also are allotted to medicine and surgery in proportions quite different from those in which such cases occur in actual practice.

* The practical effect of this consideration may be seen in the crowded condition of several of the hospitals; as was the case, at the time of our visit, at St. Antoine and Beaujon.

† In all London hospitals, and in almost all English and Scotch hospitals, none but gratuitous patients are received; but many of the Dublin hospitals admit patients who pay, and at several rural hospitals the servants of subscribers are received for a small payment. This regulation must tend to increase the number of comparatively trivial cases. In some cases the rate of payment is increased for ailments resulting from immorality. At the Belfast General Hospital, patients residing more than eight miles from the town are charged 1*s.* a day; but cases of syphilis are charged 1*l.* 1*s.*, and cases of delirium tremens, 2*l.* 2*s.* per week.

‡ Viz., the London, University College, Charing Cross, and the Royal Free.

This preponderance of surgery in English, as distinguished not only from Parisian, but also from Scotch hospitals, is one of the chief causes affecting their sanitary condition. Again, the beds are given away to patients under regulations which are quite different from the system which prevails in Paris. At the "endowed" hospitals, as they are called (St. Bartholomew's, Guy's, and St. Thomas's), patients are freely admitted.* A few other hospitals also receive patients without further restriction; although even at most of these "free" hospitals patients with ordinary diseases are obliged to come on a certain day in the week; only the most urgent cases being admitted on application. But at the great majority of London hospitals, which depend entirely or almost entirely on private bounty, it has been found necessary, in order to conciliate the subscribers, to allow them a kind of right of nominating the recipients of their charity. A larger or smaller proportion, according to circumstances, which we shall endeavour to point out, are received for considerations of urgency, that is to say, for purely medical reasons; but the bulk of the patients are received, partly on account of the gravity of the disease, and partly because they bring a subscriber's letter, that is to say, partly for private reasons. Another difference between the hospitals of London and Paris must be noted as having a great bearing on the question of the sanitary condition of various hospitals; viz., that most of those of London have attached to them separate schools of medicine, while the faculty of medicine at Paris is a centralised institution, having no special connexion with one hospital more than another. Many circumstances springing out of this connexion between the school and the hospital will readily suggest themselves as having a tendency to increase the proportion of grave cases in the hospital, such as the desire of medical men educated at the school to place cases of interest, doubt or danger, under the care of their former teachers; the desire of patients to come into a hospital served by men of celebrity; the desire of able medical men to obtain cases which will afford opportunity for the exercise of their skill, and will be the source of instruction to their pupils. Under the Parisian system, all the hospitals are supplied with a tolerably uniform proportion of cases of very much the same kind. In London, especially during the session of the medical schools, there is no doubt in some hospitals a difference in the class of cases from what may be observed in other hospitals, or even in the same hospitals during vacation, which depends chiefly on the causes connected with the medical school which we have above enumerated. In some of the smaller hospitals the wards are kept more empty in vacation than during session, in order to economise funds.† These considerations act less on the larger hospitals; but we think that we may say generally that when a hospital has a large school and a wide reputation the wards are likely to be kept more full, and the average of cases will be more acute, and therefore the hospital will be, so far, more likely to be affected by hospital diseases than under opposite circumstances.

On turning to English country hospitals, properly so called, that is to say, to hospitals usually of small size, situated in small towns and in rural districts, the differences which we have noticed between those of Paris and London become still more marked. No proportion is kept between

* Subject to the regulations as to number of beds, exclusion of small-pox, and proportion of medicine and surgery, above stated.

† We may instance University College Hospital, London, and the City of Dublin Hospital. In all our hospitals there is more room during the summer vacation; but this is partly because they are whitewashed at that time of year.

the number of the beds and the wants of the district,*—all cases of infectious disease are in most cases excluded,†—the right of the subscribers to nominate the inmates of the hospital is far more rigidly enforced,‡—the proportion of accidents and urgent cases admitted without such nomination is smaller,—and the stimulus derived from the presence of a large body of students, and from the requirements of medical teaching, is absent. Consequently these establishments are practically reduced to the treatment of accidents and cases of chronic disease.§ It is quite true that acute non-febrile (or non-contagious) cases would be received at the hospital, if they presented themselves; but they rarely do so except, perhaps, cases of acute rheumatism.‖

That the same considerations have also their effect on the death-rate of the hospital, we shall endeavour to show when discussing the question of hospital death-rates. What we are now contending is that the more liberal regulations tend to keep the wards more full, and full of more acute cases, and therefore that the first question which should be settled in inquiring into the sanitary condition of a hospital is, what are its rules for the admission of patients. The death-rate of a hospital is, as we shall show, quite a different thing from its sanitary condition.

The functions which in Paris are exercised by the hospitals in the treatment of acute disease are discharged in the country districts of England by the medical officers of the poor law unions, and of the clubs, and the hospitals are reserved for the chronic cases. In many country hospitals the beds are taken for some time beforehand;¶ in many the subscribers would not think they obtained fair value for their subscription unless their nominee was admitted, however little prospect there might be of his receiving more benefit by treatment at the hospital than at home; and not only admitted, but kept for the full "term" as it is called, that is to say, the time during which a letter is good.** The consequence is, and must be, that the hospital is looked upon amongst the poor as a private charity, as far as *disease* is concerned, and admission into it is sought through private channels, just as into an almshouse; in fact these country hospitals have become in great measure sick clubs, in which the employer pays instead of the patient. *Accidents* are known to be freely received, and are consequently always taken to the hospital; but we believe we are right in saying that, at hospitals of the purely "country" class, urgent medical cases hardly ever present themselves, except on the day of the weekly admission, and then very rarely. Such a hospital, therefore, usually contains a few grave accidents, and a still smaller number of cases requiring surgical operation, amongst a much

* Compare the population and emergencies of the neighbouring towns of Chichester and Portsmouth. The hospital accommodation in the former is more than double what it is in the latter—80 beds at Chichester, against 33 at Portsmouth.

† And this regulation, as we shall show, involves the exclusion of almost all acute medical cases.

‡ Thus, at the Adelaide Hospital, Dublin, many of the beds are reserved for the nominees of individual governors, whose names are inscribed over the beds.

§ At some hospitals, as at Exeter, there used to be a rule that medical cases should not be admitted without a letter. The rule is abrogated, but the custom produced by it still exists.

‖ Thus, at the Radcliffe Infirmary, Oxford, in the year 1862, out of 896 patients admitted, only 10 medical cases were taken in without letters, on account of urgency. At Hull, again, we were informed that medical cases were as a rule admitted only by letter; and at Taunton, out of 1,493 cases admitted in two years, only 110 were casualties, of all kinds.

¶ e.g. Northampton, Southampton.

** This is usually either six weeks or two months. After that time the patient, if he is to stay, requires another letter.

larger number of chronic invalids, who have little more influence on the sanitary condition, or on the atmosphere of the hospital, than if they were in a condition of health: very few of the patients are in any danger of speedy death, and of those who are gradually sinking from visceral disease a great part prefer to go home, when they find that they can expect no benefit from treatment, or feel themselves near their death. Another effect of this strict adherence to the letter system is that the hospital is seldom, if ever, full; and that the daily average of patients is very greatly below the number of beds.* Now the effect of these two causes upon the sanitary condition of the hospital in which they are at work cannot be otherwise than good. No one would deny that a building which must contain a considerable number of inmates will be more wholesome the nearer each of those inmates approaches to a state of health, nor would any one deny that a moderately full dwelling-house is more wholesome than one which is crowded.† It is for these reasons, we conceive, that many country hospitals are said to be "very healthy," and we have no doubt are so, although they utterly violate all the rules of construction which experience has shown to be necessary in hospitals for acute disease, and the violation of which in the case of such hospitals is promptly followed by the outbreak of hospital diseases.‡

We regard, therefore, the regulations which exclude grave cases of disease from our country hospitals, and which diminish the proportion of such cases in many town hospitals, by throwing the nomination of patients into the hands of non-medical persons, as a cause of comparative salubrity in the hospitals to which such regulations apply. In any other point of view we cannot help regarding such regulations as an unmixed evil; possibly a necessity of the system under which our

* The tables, pp. 569–70, will show the numbers found in the metropolitan, provincial, and rural hospitals at the time of our visit, compared with the number of beds; but the average number of patients, as stated in the hospital report, or the actual number in the house, as stated in our tables, is not a perfectly accurate test of the fulness of the wards in all hospitals. Thus, at the London Hospital, although the pressure for room is very great, and must lead to the speedy increase of the size of the hospital, the average number and the number in the house is always greatly below the stated number of beds. The reason is, that there are some special wards hardly ever full, and that one accident ward is kept for each alternate week. Again, in some hospitals (as at Edinburgh) special circumstances keep part of the hospital unused for a time. In other cases (as at Huddersfield and Canterbury), though there are too few applications to fill the beds, yet considerations of economy induce the managers to shut up some of the wards, in consequence; so that those which remain in use are as full as if the whole hospital was crowded. These, however, are special cases; in most country hospitals the wards are seldom quite full; if they were they would be overcrowded, since they are not spacious enough properly to accommodate the stated number of patients; and this is still more the case (to judge by the few instances we have seen) in military hospitals. A curious illustration of the effect of the latter system upon the supply of patients is furnished by one of the hospitals which we have visited, where the hospital is moderately full while the governors have a good stock of letters, but becomes half empty at the season of the year when their stocks of letters are becoming low. This shows how little the practice of such hospitals corresponds to the real wants of the population.

† The table on page 569 shows, that out of 4,093 beds made up in the rural hospitals, there referred to, only 2,813 were occupied at the time of our visit. The same table will show the difference at various hospitals, metropolitan, provincial, and rural, between the number of beds in hospital and the average number of inmates, or the real number of beds occupied.

‡ This observation might be supported by reference to a great number of rural hospitals. We would instance the hospital at Stafford as one which would be inadequate for its purposes if the nominal number of the beds were kept up, and still more so, if the beds were kept filled with acute cases. The experience of the Chester Infirmary, also, is here in point. See page 548.

hospitals are established and maintained, and, if so, to be endured, but only as an evil. The greater salubrity of the hospital is obtained only by its omitting to perform its most important duty, that of affording succour and safety to those among the poor who are in the most grievous danger. It is no exaggeration to say that a large proportion of those who are under treatment in our country infirmaries might be treated with as much success at home, while the victims of acute disease are left to be attended in their own squalid houses by the overworked officers of the club or the parish. The evils of this system appear to be known even where it is still adhered to, since many of the hospitals at which the system of weekly admission by letter still prevails dwell with complacency on the large proportion of their patients who have been admitted on the free system.* Again, both the weekly admission and the weekly discharge act as obstacles to the entrance of acute cases, the former by inducing an idea that patients are not received except by letter, and the latter by keeping beds occupied till the day of the weekly discharge by patients who might just as well have left some days earlier. The large proportion of surgical cases also which is found in almost all English hospitals tends in the same direction. In the great London hospitals†, and others where the medical cases are acute, this disproportion is in some measure remedied by the shorter duration of treatment of medical cases; but this seems not to be the case with the chronic diseases which fill the medical beds in country hospitals. What the reason for the disproportionate importance so generally attributed to surgical cases in our hospitals may be we do not pretend to decide.‡ If it is on account of the supposed number of accidents, the allowance has been made far too large, as may be easily seen by consulting the numbers given for accidents and urgent cases, (of which most of the latter are medical), in almost any hospital report. It seems strange that while at least two thirds of the cases seen in private practice would be classed as medical, the proportion should be reversed in public practice. It is perhaps not presumptuous to say, that the change of medical opinion in recent times has tended more

* See the annual reports of King's College, St. George's, and the Birmingham General and Queen's Hospitals. We must not forget that the effect of the letter system is very different in different hospitals. We believe it to be always bad; but in hospitals like those above named a large number of acute cases are sure to be sent to the hospital by letter, and, again, a large number are sure to apply from the indigent population in the neighbourhood, so that in estimating the effect of hospital regulations on the supply of patients, care must be taken to make allowances for the situation of the hospital. The remarks in the text apply with most force to rural hospitals, and to some in large provincial towns. What has been said about the rules limiting the admissions of acute diseases must also be construed with similar reference to the circumstances of the hospital. Thus in hospitals situated in busy crowded cities, it is often found practically impossible, or unadvisable, to follow the rule relative to the exclusion of fevers. Such is the case at the Hull Infirmary. With respect to the known evils of the letter system, we quote the following from an annual report of the Queen's Hospital at Birmingham.

"In reference to these cases, [*viz.* phthisis] especially, your Committee of Council "would earnestly and respectfully request their Governors and Subscribers, as far as "possible, to observe the regulations printed on the ticket of admission. A large "number of patients have been, from the fear of giving offence, admitted, who could "derive no benefit at the Hospital; and, consequently, a large number have been "deprived of that relief which a residence within its walls would have afforded."

† The disproportion does not exist in all London hospitals, e.g., King's College Hospital and University College.

‡ We must of course be understood here as speaking of hospitals in general. There may be very good reasons why some hospitals should receive surgical accidents chiefly, or almost wholly. Thus, the London Hospital, and the Northern and Southern Hospitals at Liverpool, are chiefly devoted to the reception of accidents.

than anything else to diminish the importance once attributed to drugs in the treatment of acute diseases, and to increase that which is now ascribed to general management, by nursing, diet, cleanliness, fresh air, and the like. The drugs can be administered as well in one place as another, provided the patient can get attendants at home who will take sufficient care of him to give them punctually; but can the poor be provided with the other essentials as well at their own homes as in hospital? Can they in many cases have them at all except in hospital? We may be accused of trespassing beyond our province in thus entering to a certain extent on the question of the general effect of such rules, apart from their sanitary influence; but we could not resist putting on record distinctly our conviction, forced on us by a comparison of the hospitals in English counties with those of London, and of these latter with the Scotch and Parisian, that our system is a much inferior one to both of theirs, and that it tends to reduce to the smallest possible amount the good which is done by our large establishments and liberal expenditure of money.*

It is not until it shall be generally recognized that a hospital ought to be a place for the free reception of acute disease, and that most acute diseases are medical, that any accurate comparison of hospitals in different situations will be possible.

The great differences then in our hospitals depend, as far as we can see, upon the different kinds of cases which they receive, and this upon the different systems on which they are founded.

We have hitherto spoken only of the inmates of the hospital; but these form only a minority of the patients in most of our country and all our metropolitan hospitals. The out-patient department is of great importance in London, where the patients have to come to the hospital, and of still greater importance in many country towns, where the hospital officers go to the residences of the patients. There are few questions connected with hospital management on which more difference of opinion exists than on the value of the out-patient department. There can be no doubt that the number of patients who present themselves at the out-patient rooms of the large hospitals is too great to allow of their cases being deliberately examined, and that there is very little certainty that the treatment recommended will be properly carried out; but these objections apply rather to the patients themselves than to the hospital.† In a sanitary point of view, the out-patient department is to be looked upon as a source for supplying the hospital with in-patients. In this respect the out-patient department of our "free" hospitals is of the greatest value‡, and at all hospitals where the patients are not seen at their own houses it is exceedingly useful. Where the hospital officers are sent to the houses of the patients, the result seems to be that the latter prefer having good gratuitous advice, and staying at home, to going to the hospital.§ At some country

* While praising the liberal, humane, and wise system on which the Scotch hospitals are organized, it would not be right to pass over the comprehensive foundation called the House of Industry Hospital, at Dublin, where all the sick poor, with whatever disease they may be afflicted, are received at all times, and without other recommendation than the gravity of their illness.

† In the hospitals of Paris, the out-patient department is, as its name implies, only for "consultations." The patient is provided with a medical opinion, and a prescription, but is not treated, unless admission is granted to him into the hospital. The same is the case at the House of Industry, Dublin.

‡ This is found to be the case at the Royal Free Hospital.

§ This is so in England, as we were informed at the Chichester Infirmary, as well as at Portsmouth and other places. But in English hospitals the prior claims of the subscribers must prevent the medical officers from admitting very freely from amongst

Fever wards.

places in Scotland the officers of the hospital and the Poor Law Union are the same persons, and this arrangement appears to have a good effect, as they are enabled to select the most urgent cases, and have them transported to the hospital.*

The great majority of our English country hospitals exclude all fevers, while those which admit fever usually place such cases in separate buildings or separate wards. Many of our London†, and a few country‡ hospitals, admit all febrile diseases, except small-pox, and that such diseases may be treated without excessive danger in the wards of an ordinary hospital their experience sufficiently shows; but the great majority of country hospitals which admit fever place such cases either in a separate building or separate wards from which small-pox is almost always, and scarlet fever is often, excluded. In Scotland, the honourable distinction of the hospital system is, that at the smallest as well as the largest every disease is received; but we believe the system of separate wards for fever and small-pox is universal.§ This system of separate fever wards is one which deserves very careful consideration. It is intimately connected with the question of the risk of contagion; and this, there can be little doubt, varies very greatly for different diseases. Thus if small-pox be received into any part of a general hospital, there is much danger of its affecting patients even in other parts. In the Scotch hospitals and in several of our English hospitals‖ small-pox appears to be admitted (though only in scattered cases) into the fever wards, or into separate wards, adjacent to them: in some cases, however, it has spread in the hospital.¶ On the whole, as far as our present experience goes, it appears unjustifiable to expose patients in a general hospital to the risk of having cases of small-pox amongst them. It is otherwise with the other exanthemata; scarlet fever is received at the above-mentioned London hospitals, and as far as we know (having long personal experience of two of them) without any detriment; nor does it appear certain that typhoid fever has manifested

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the out-patients. In Scotland the "district" department appears to be specially important as a feeder to the hospital. Thus at the Dundee Hospital, some of the medical officers of the hospital visit the sick poor in each quarter of the town, and send into the hospital such as require admission; and the same excellent system prevails, as we were informed, to a great extent also at Whitehaven.

* This is the case at Arbroath amongst others.

† e.g. St. Bartholomew's, Guy's, St. Thomas's, the Middlesex, and St. George's. We do not mean to say that no patients have ever caught fever from other patients in the wards of these hospitals. At the time of our visit to the Middlesex Hospital, two patients were suffering from scarlet fever caught in the hospital. Scarlet fever is so contagious that patients wherever they are will sometimes propagate the disease; and this happens in hospital wards as elsewhere; but it seems to us that it happens far more rarely in hospital wards than elsewhere. Now, patients with scarlet fever must be treated somewhere, and we believe that they are much less likely to spread the disease if treated in a general hospital than if kept at home.

‡ Very few of our English country hospitals admit any fever into the general wards. This is, however, the case at Bath, Chichester, Reading, and Oxford. In most of these, however, scarlet fever is excluded.

§ Many Scotch hospitals admit a very large proportion of fever. At Greenock, at the time of our visit, the majority of the patients were in the fever-house,—36 out of 66. Even fever-houses differ from each other in their nature. In Scotland, all admit the exanthemata, including small-pox. In England, small-pox is excluded from most, and scarlet fever from many, e. g., Leicester; and since at many of these towns, as at the one just named, typhus fever has not hitherto been prevalent, the institution is almost restricted to the treatment of typhoid fever.

‖ e.g. Birmingham, Queen's Hospital, Whitehaven.

¶ As at Dumfries.

any tendency to spread among the patients.* With typhus the case is otherwise.

In the case of separate fever wards, however, or fever-houses, the evidence is not of this negative description. Sad experience has shown how extremely dangerous such places are to the medical and other attendants on the patients, and to the patients themselves. During the short time we have spent upon this enquiry, and among the comparatively few hospitals, which comprise a separate fever house or fever wards, we have visited no less than three† in which the resident medical officer had just died of fever caught in the wards, while in others the house surgeon, or other residents, had been attacked, but recovered.

It seems then, on a review of the evidence that we possess, that if in a general hospital fevers of all kinds be scattered about in the wards, there is some risk of the spread of fever to the patients; if they be collected into separate wards, there is great danger to the medical attendants. In either case the nurses will be in danger, and of course in much greater danger under the latter system. It appears to us that in endeavouring to point out the most prudent course to pursue, it is necessary to distinguish between different cases. When typhus fever is so prevalent that if it were indiscriminately admitted the wards would become crowded with it, it appears that even the best constructed hospitals will be poisoned by it, and become unfit for the purposes of a general hospital. Otherwise, that is, when the proportion of cases of fever to general cases is small, there seems no great risk in admitting them, if the hospital is well ventilated, and the beds a sufficient distance apart, and if patients who are well enough to go about are carefully kept away from the fever beds. We believe that if our country hospitals were of perfect construction, a moderate number of fever cases (say one or two in each ward, according to their size,) might be admitted without danger, and that this plan would be far preferable to that of special fever wards, by which *so many* valuable lives have been already sacrificed. But in order that fevers may be safely received, the general arrangements and ventilation of the hospital must be very different from those which we have described at many country hospitals, where no doubt the more prudent course has been adopted in excluding these diseases altogether. It must be remembered, however, that the cases must be treated somewhere, and if the hospital be well constructed it ought to be a far more fit place for the treatment of disease than a poorhouse infirmary, or a crowded cottage.

Dr. Murchison, in advocating the establishment of separate fever hospitals, has dwelt on the following facts:—(1) that in the first six months of 1862 1,107 cases of typhus were under treatment in the London Fever Hospital, and that the mortality was 20·95 per cent., while out of 343 patients under treatment in six of the general hospitals the mortality was 23·32 per cent.; and (2) that 1,080 cases were admitted into the Fever Hospital, and communicated the disease to 27 persons, of whom 8 died, while 272 cases admitted into the above general hospitals communicated the disease to 71 persons, of whom 21 died.‡

* We are not speaking of the nurses. Thus at the Royal Free Hospital two nurses lately died of typhoid fever, caught, in all probability, from a patient; but this has no bearing on the question of fever wards. The nurses would certainly not have been exposed to less risk in a special fever ward. As to the spread of typhoid fever among patients, a doubtful example of this was lately experienced at the Bath United Hospital.

† viz., Dundee, where two resident medical officers have died in three months, and patients admitted with other fevers, &c. have caught typhus; Manchester, where the resident medical officer died, and one of the physicians was attacked; and Chester.

‡ On Continued Fevers, p. 612.

We do not propose to discuss the former fact. Whether the mortality of typhus is greater or less by 3 per cent. in general or special hospitals appears to us a fact of no significance, unless the nature of the cases and the medical treatment could be known for each case. Without personal acquaintance with the evidence on which the latter statement rests, it is impossible to say what credit is due to it, since the fact that 71 cases of typhus commenced in persons who were inmates of these hospitals during the period in question might be susceptible of other explanations than that they caught fever from the patients. But allowing that Dr. Murchison's facts are indisputable, do they support the conclusion* that fevers ought to be banished from general hospitals? No evidence produced from the London Fever Hospital can possibly satisfy any one that fever hospitals are otherwise than dangerous to nurses, pupils, and house surgeons. It may be that the seasoned inmates of this hospital, in which, be it remembered, the scarlatina patients are isolated from the others, and the nurses and medical attendants have most of them passed through the necessary ordeal, rarely contract fever in any given six months. We may also admit that in epidemics of the more contagious fevers, such as typhus and scarlatina, when the number of cases rises to such a height that if they were scattered through the wards of a general hospital, these latter would become in effect fever wards, it may be necessary to fix some limit to the number in each ward.† This was the case at St. Bartholomew's Hospital in the year 1862. But these are cases which at present occur comparatively seldom. The experience of many London hospitals, (extending over a period of at least a century, in the cases of Guy's, St. Thomas's, St. Bartholomew's, the Middlesex, and St. George's,) proves that the ordinary proportion of ordinary fevers applying may be taken in with tolerable safety at those large hospitals. If we wish to apply such experience to the hospitals of small towns, we must endeavour to form an estimate of several probabilities, such as the following:—Would the proportion of typhus and scarlatina‡ likely to apply be so great as to convert the house into a fever hospital? Would the risk to the other patients from admitting the fever cases which apply be greater than the risk of treating the latter at home? Would the establishment of a separate fever hospital be worth its cost?§ Unless the proportion of typhus should prove to be very much greater than we believe it would in country places (where typhoid fever is, as a rule, far more prevalent) we can see no reason to think that any great danger would be run by the admission of all the cases of continued fever that might apply. But in most hospitals there are one or more wards on the attic floor which would be capable of conversion into separation-wards in case of a more

* We do not mean to say that this is Dr. Murchison's conclusion; but it is the point which we have under discussion.

† At some hospitals (e.g. Chester) the number of cases of fever is kept down by exacting a payment—1*s.* a day in that case. At the London Fever Hospital, also, the patients are paid for, usually by the parish or other public institution from which they are sent.

‡ We take it as conceded that a moderate number, at any rate, of cases of typhoid fever, relapsing fever, febricula, and, in case of necessity, of diphtheria, might be safely admitted.

§ In some country places, the separate fever-houses are almost useless. At Bedford, the fever house is generally empty, or nearly so; and at Newcastle, in one of the last reports, the medical officer of the Fever Hospital suggests, that it should be converted into a Lock hospital, and the fever cases admitted into the General Hospital. In some hospitals, (e.g., Brighton, Nottingham,) the fever house is also used for the reception of syphilis.

than usual prevalence of this disease. As to the exanthemata, we have already expressed our opinion that smallpox must be excluded from the ordinary wards. Scarlet fever is safely admitted into many general hospitals in ordinary proportions, and we would apply to it the same observations as to typhus, though perhaps with more hesitation.

But the second question is the really important one. The treatment of contagious diseases no doubt involves risk. No doubt such diseases, if taken into any hospital, general or special, will occasionally spread; but will they not spread if the patient is left at home? And is not the spread of such fevers due in part to the fact that so many of our hospitals (particularly in small country towns) shrink from the performance of their most serious duty, viz., that of treating the acutest forms of disease? If it be replied that in such cases separate fever houses should be added to the hospital, we would remark, that such fever houses are often found to be almost superfluous, from the small number of patients who apply at times when fever is not epidemic, and that when this is the case a valuable portion of the hospital is kept unoccupied. But that the hospital should have the power of treating acute disease is the first requisite, and for this it is necessary that no rule should exist excluding fevers. Whether the cases of fever ought when admitted to be isolated or scattered is a question on which the opinion of those who have the best right to express one appears to vary very much. Our own impression, from what we have seen at the various hospitals visited, inclines us to believe that scattering the cases is the safest course, if the hospital be spacious, and the applications not too numerous; and in contrary circumstances, that they should be placed in separate wards, the patients with typhus and scarlatina separated from each other, and of course from the rest of the patients.

At some hospitals*, where separate fever wards are used, the beds are placed very wide apart; and this, as far as we have been able to learn, is a successful plan. But perhaps a better one is to place the cases in the general ward, removing contiguous beds, if it appear necessary, as is done at King's College Hospital.

We repeat that for the safe reception of fever large well-ventilated wards, and beds well removed from each other, are essential; and we must also repeat that in our view the reception of fever is a necessary qualification for the due and efficient discharge of the duties of a general hospital.†

Separation of diseases.

We have thus far endeavoured to show that the establishment of separate fever wards and fever houses is in ordinary times unnecessary. But there are other diseases which are treated separately in some hospitals and not in others; such as, diseases of the eye, syphilis, erysipelas, and the kindred affections. Again, accidents are treated separately from other cases at many hospitals, and surgical cases separately from medical at still more. We must inquire whether such regulations have any effect upon the results of practice.

Eye diseases.

That eye diseases should be treated in separate wards appears almost necessary for the patients themselves; and this is a very useful employment for such small wards as there may be in the hospital, the ventilation of which may be thought hardly sufficient for acute general cases. Further than this we have no remarks to offer on an arrangement which is so nearly universal that it must be allowed to be necessary.

* For instance, the Sussex County Hospital at Brighton.

† Those who have argued this question have paid too little attention to the fact, that in country hospitals the exclusion of fever involves that of almost all other acute medical cases.

The separation of syphilis into distinct wards, and even the admission of the disease at all, are points on which practice is by no means so unanimous; for instance, the practice in both these respects varies at almost all our large London hospitals. At St. Bartholomew's and Guy's syphilitic patients, both male and female, are admitted freely, and placed in separate ("foul") wards. At the London Hospital female syphilitic patients are only admitted by letter, so that those who apply are few; they are placed in separate wards. At King's College Hospital they are placed in the general wards. At St. George's and University College they are by rule excluded, and if admitted are only admitted as general patients. At the Royal Free Hospital there is a separate ward for female syphilitic patients, while males are placed in the general wards. In the country the practice is not less various. Examples of each of these different plans will readily be found in country hospitals; and to them we will only add one other, that is to say, that at towns where there is a Government dockyard several new hospitals have been founded, consisting of a small general hospital, having attached to it a small Lock hospital for females, supported by the Government, and in which the patients are received freely.

We may be allowed to consider both questions as they affect the sanitary condition of the hospital, viz., whether it is desirable to admit syphilis at all, and if so whether into separate wards, or no. As to the first question, if any medical necessity could be shown for the admission of such cases, of course they should be admitted. The assumption on which we have founded this Report is that a hospital is to be a place in which every one is to be received who is poor enough and sick enough to require it. In this point of view it is not to be denied that the graver cases of phagedæna, and some of the sequelæ both of gonorrhœa and syphilis, are affections so severe that they demand admission; nor do we find that such cases are refused even at the hospitals from which syphilis is by rule excluded. To this extent, then, it is probable that syphilitic patients must of necessity be received, just as a case of grave accident would not be turned away because the patient might be affected with syphilis. But the habitual and regular reception of venereal patients is a different matter; and it is a regulation for which we confess that we have found no sufficient justification in the practice of the hospitals which we have visited, while there are many obvious objections to it. It can hardly be said that the placing of venereal cases in the wards is necessary for hospitals which have a medical school attached, since such cases can be as well, or better, studied in the out-patient room. It will, we believe, always be found that when venereal diseases are made a regular object of the practice of the in-door department a very considerable number of male patients with gonorrhœa and ordinary chancre will be received; and the real effect of the admission of such cases is to take up the funds of the subscribers in relieving persons who are no fit objects of charity, and who could be as well treated out of the house, to the necessary exclusion of an equal number of more urgent cases. For these reasons, having reference to sanitary circumstances only, and quite apart from all considerations of good manners and good morals, we believe that the regular admission of ordinary cases of syphilis and gonorrhœa into hospitals is a waste of the funds of the charity. To admit cases of female syphilis by letter appears to us the worst possible way of dealing with the difficulty, since it makes that admission depend on private considerations which ought to be granted for medical reasons only. The practical effect in hospitals where it is followed is to reduce the cases (at least in females) to a small number of trivial affections.

The question of separate Lock wards resolves itself into that of the habitual or exceptional reception of cases. If prostitutes are to be admitted in any large number, it is necessary to keep them under separate custody; and even the reception of single patients of bad character into a female ward is sometimes a ground of complaint. Otherwise there is no reason why syphilitic phagedæna or laryngitis should be treated under different regulations from other cases of phagedæna, or laryngitis. In the former case, if the sloughing were very considerable and offensive it would be perhaps considered necessary to isolate the patient; in the latter she would be placed in the general ward. To isolate cases of male syphilis appears to be entirely superfluous. But though we believe the institution of separate Lock wards unnecessary, we do not find that it is productive of any very grave mischiefs, such as we believe to have existed in the "foul wards" of former days. Phagedæna is, we believe, slightly more common in such wards than in those of the general hospital,* but then the patients are for the most part of dirty habits and broken down constitution. The less interesting nature of the cases, and the remote position of the wards, do also, we believe, tend to render the visits to this part of the hospital less frequent, and therefore to check the supervision which they so much require; hence such wards usually appear less cleanly and less well ventilated than the rest of the hospital. These two objections appear to us to be supported by facts, but we do not urge them as of any very decisive weight.

Syphilis.

It is fortunately not necessary for us to express any opinion on the propriety of founding Lock hospitals, or on the policy of paying from the public funds for the cure of some of the prostitutes of dockyard and garrison towns, the sanitary position of such hospitals being simply that of the Lock wards in a general hospital. All that we have seen seemed well ordered, and free from any undue prevalence of hospital diseases.

We now come to the question of separating erysipelas and the allied affections from the general patients. On this subject the widest diversity of opinion and practice prevails in different parts of the country. In London, where hospital diseases are believed to be more common, but where also hospitals are, as a rule, better constructed than in the country, there is in general no regulation for the isolation of such cases, nor does the want of such a regulation lead to any harm. Thus, at St. George's Hospital, where one of your reporters has been in constant attendance in the surgical wards for 15 years, he can affirm, from personal knowledge, that during that period, although sporadic cases have of course occurred, and in greater numbers in one year or season than in others, erysipelas has never spread in the wards, and the disease has been in the immense majority of cases devoid of all danger either to the patient himself or to his neighbours. That the same is generally the case at the other large metropolitan hospitals will appear, not only by the absence of regulations for isolating such cases, but still more conclusively by the absence of cases from the post mortem records. Epidemic attacks (so-called) of erysipelas do, however, sometimes occur, as has been the case lately at King's College Hospital. Diffuse inflammation of the cellular tissue, or phlegmonous erysipelas, does indeed often attack scalp wounds and compound fractures in the wards of hospitals, both in country and town, especially in persons of drunken habits, but it appears to be

Erysipelas.

* We believe this to be the case in the "foul" ward at St. Bartholomew's Hospital.

Erysipelas.

a local affection, and never, as far as we have heard, spreads to contiguous patients.

In rural and provincial hospitals* we find many different rules on the subject of erysipelas. We are not concerned to discuss here the total exclusion of erysipelas; a regulation in force at many hospitals. What we have said above as to the impropriety of excluding other diseases reputed to be infectious of course applies with much greater force to this affection. Thus it is sent out of some hospitals† ; at others distinct wards are set apart for all the cases‡ ; at others, each case is sent into a separation-ward.§ Why is it that plans which are not found necessary in London are in use at these hospitals? We believe we are justified in referring the difference to the inferior sanitary condition of most provincial hospitals; we mean to their inferiority in ventilation and spaciousness, and occasionally in cleanliness. Erysipelas appears less frequently in country hospitals than might have been expected from the defective sanitary arrangements of some of them, in consequence of the comparative mildness of the cases under treatment, and the greater healthiness of the patients; but when it does break out it appears sometimes to spread to a degree, and to assume a malignity, of which we have had no examples in London of late years‖ ; and this we believe to have been caused in the hospitals so attacked by defective sanitary arrangements, which were pointed out to us when we visited those hospitals, and which have in most cases been remedied. The inference from the facts which we have observed is irresistible, that in a well ventilated and spacious hospital erysipelas will rarely show itself even in sporadic cases, although the acutest cases of accident and disease be freely received, and if the cases are slighter and more chronic it will be almost unknown; that in such hospitals sporadic cases when they occur will be generally harmless, and that no necessity for their isolation exists; but, on the contrary, that in ill-ventilated or foul hospitals, however healthy their site, and however favourable their class of patients and of cases, erysipelas is liable to show itself, and to prevail to an extent which no isolation of cases will check. In either case, separate erysipelas wards, or the separation of cases of erysipelas into single-bedded rooms, appears to be superfluous. There can be no reason for separating erysipelas, if the hospital is fit, as every hospital ought to be, to receive cases of continued fever.

Phagedæna.

What we have said as to erysipelas will apply also to phagedæna and hospital gangrene. On the way and the extent in which this and other hospital affections prevail in the hospitals of London and the large towns, we have spoken in another section.¶ Some condition of the atmosphere affecting the hospital and its immediate neighbourhood appears to have been usually the direct exciting cause of any so-called

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* It may be as well to state here that, in order to avoid ambiguity in the use of terms, we have restricted the sense in which we have applied the terms "provincial," "country," and "rural," to our English hospitals. We have applied the term "country" to all hospitals out of London; "rural," to those situated in small towns; i.e., to all except the following, which we have termed "provincial," viz., the hospitals at Birmingham, Bristol, Hull, Leeds, Liverpool, Manchester, Newcastle, and Sheffield, amongst English; Edinburgh, Glasgow, Aberdeen, amongst Scotch; Dublin and Belfast amongst the Irish hospitals.

† As at Reading. At the Royal Free Hospital, London, at Southampton, and a few other hospitals, erysipelas is excluded.

‡ As at Birmingham General Hospital, and Bristol General Hospital.

§ As at Bedford, the Royal Free Hospital, and Chichester Infirmary.

‖ This has been the case at Oxford, Bury St. Edmund's, York, Reading, Winchester, &c.

¶ Vide Health of Hospitals, pp. 545 et seq.

epidemics* which may have occurred; but the influence of dirt, and especially of the negligent dressing of wounds, seems well established, and ought to arouse the strictest attention of the surgeons. That cases of phagedæna are often benefited by removal to another ward may be true†, and this may depend as much on a change of nurse as on the change of air: that several patients in the same ward may contract phagedæna may depend on a dirty condition of the ward‡, or on the wounds being badly dressed§; but no necessity has been yet shown for the isolation of such cases; nor in London, where the disease is certainly most common, is any objection found to receiving and keeping persons affected by it in the general wards.

Pyæmia.

The exhalations from a large number of acutely suppurating sores produce an atmosphere in the ward, which, as it appears to us, is one of the most certain sources of hospital disease. It is, as it appears, chiefly to the differences which exist in this respect between different hospitals that their different liability to pyæmia depends. Without denying the existence and the influence of other causes, it appears tolerably certain that if a number of large wounds, running an acute course, be congregated in the wards of one hospital, and only a few open sores, and those in a chronic condition, be habitually in the wards of another, the former hospital will be far more liable to phagedæna and pyæmia. This is a fact which is hardly susceptible of statistical proof. We have given elsewhere a comparison of the differences which exist between town and country hospitals in respect of the numbers of open sores in their wards at the same time, to which it must be added that the more active the practice at any hospital is, and the greater are the number of urgent cases received, the more acute will be the process of suppuration in a large proportion of the cases in the wards. Every surgeon is aware of the great difference which is found between the amount of exhalation from a large wound in the process of active suppuration (as in an amputation) and from an ulcerating surface in an indolent and chronic condition. Hence, as it seems to us, the directors of many of our country infirmaries have done well to mix the medical and surgical cases together, and to scatter the cases of injury and operation about among a number of patients not affected with wounds.‖

Operation Wards.

For the same reason we have been disposed, on theoretical grounds only, to regret the formation of "operation wards," where all the most acutely suppurating cases shall be brought into the same chamber. But we must repeat that such grounds of objection are only

* Using this word in its very loosest sense, as meaning little more than unusual prevalence in the neighbourhood.

† This was the case in an outbreak of hospital gangrene a short time ago at the Birmingham General Hospital.

‡ So it is sometimes found that phagedæna will cling to a ward till it is turned out and thoroughly cleansed down; as was found necessary at University College Hospital, a short time since. The same thing has been noticed of pyæmia.

§ Many surgeons believe in the frequency, in large hospitals where post-mortem examinations and dissections are frequent, of inoculation of wounds, from the hands of dressers and house-surgeons, with the products of decomposition. Without denying the possibility of such an occurrence, we doubt that it can be otherwise than most exceptional. Neither the history of the cases in which phagedæna and erysipelas occur, nor the progress of those complications, bear any resemblance to the well-known symptoms of post-mortem infection; and the fact, that by far the larger number of cases occur among the out-patients, most of whom are not dressed at the hospital at all, is also unfavourable to this idea.

‖ A confirmation of this opinion is found in the case of the General Hospital at Birmingham, where, during a severe attack of phagedæna, it was found advisable to do away temporarily with the distinction between medical and surgical cases, in order to separate from each other, as far as possible, the cases of open wounds.

theoretical. On inquiry at hospitals* where the practice is pursued, we have not been able to find evidence of any practical mischief having followed.

REGULATIONS OF HOSPITALS.

To sum up the whole matter, every part of the hospital ought to be so constructed and so managed that it is fit for the treatment of all the most acute forms of medical† and surgical disease; and if this is the case, no separation of any class of cases seems necessary for the general salubrity of the building; nor is such separation practised at the hospitals where these cases are treated with the greatest frequency and success.‡

Special hospitals.

As to special hospitals it is unnecessary that we should say much. There are two very different kinds of speciality; viz., of cases and of patients. To the first belong the hospitals for fever, small-pox, consumption, eye diseases, syphilis, convalescents; to the latter, the hospitals for children, women, soldiers, and sailors. The question of the propriety of establishing hospitals of some of these classes is one of policy or morality, or, at least, is non-medical. So, for instance, there is no medical objection to the establishment of Lock hospitals, if they should be thought desirable; but as there is also little medical necessity for such foundations, as they are at present constituted, to hold a few of the patients of a large city, we have not thought it needful to go into the question of their construction and management. Hospitals for prostitutes are established now by the Government at many dockyard and garrison towns; but as they at present exist their scale is so small, that, whether regarded as a measure of police or of sanitary precaution, the system is quite insignificant. To the establishment of special hospitals for diseases of the eye it is hardly possible to take any objection; but as these cases are not, as a general rule, dangerous to life, it is very difficult to collect any information about their respective sanitary states, for which reason we have omitted these also. The subject of fever wards and fever hospitals has been sufficiently discussed above.

Convalescent hospitals.

The institution of convalescent hospitals, that is to say, of hospitals in which patients shall be maintained for a short time after their recovery, until their strength is more completely repaired, is a charitable and wise provision, but one which is of more importance in a social than in a sanitary point of view. Considered in regard to the sanitary condition of hospitals, the chief effect of convalescent asylums would seem to be to facilitate the more early withdrawal of lingering cases from the wards, and thus to set free the beds for the treatment of acute disease. We may hope that the scheme will be largely extended.

Closely connected with the foundation of such institutions in connection with our London hospitals,—for such institutions will always be in the country,—comes the still more important question of the desirability of seeking a rural site for what are now metropolitan hospitals. The statements contained in this Report, with respect to the relative certainty and rapidity of cure from various diseases and injuries in town and country, will be found somewhat meagre and indecisive; but we believe they adequately represent the evidence

* Such as Norwich. † Small-pox, perhaps, excepted.

‡ A certain number, however, of separation or casualty wards, for single special cases, appears to be highly desirable, if not necessary, in a general hospital, for the reception of noisy or offensive cases, for certain operations, and perhaps for some cases of acute affection of the lungs. In some hospitals, as at Cheltenham, there are separate "casualty" wards for the temporary reception of accidents, so that the general ward may not be disturbed by their admission.

which we at present possess on this vital question. What answer, then, should we be prepared to give to such a question as this:—Suppose it possible to transport St. Bartholomew's Hospital as it now is, and with its present supply of patients, from the heart of the city into the heart of the country, what would be the result on the prospects of individual patients? Our deliberate opinion is that the effect, if any, would be very trifling. That there might be some slight variation in the mortality may or may not be probable; but that the prevalence of hospital disease would be much decreased, that operations on given cases would be much more likely to succeed, or that the period of recovery of given cases would be much abridged, we do, judging from the evidence before us of the state of things in hospitals variously circumstanced as far as situation goes, utterly disbelieve. In fact, we have no evidence which shows that any change at all would be wrought in any one of these three particulars.

But if the effect of the removal were to change the supply of patients, whether as to the nature of the cases or as to the class of persons admitted,—if, instead of a large proportion of dangerous accidents and acute diseases, the practice of the hospital were to lie chiefly among chronic invalids and convalescents,—or if, instead of the worn-out victims of want and debauchery, who are the principal subjects of injury and acute diseases in towns, the healthier inhabitants of a country district were to become the inmates of the hospital,—then there can be little doubt that the success of treatment would be considerably increased.

Let us apply these conclusions to the most interesting and important of the questions which are at present agitated with respect to town and country hospitals, viz., whether it is possible to treat the sick of the metropolis or other great cities in hospitals situated in the country, and whether the benefits which would probably be derived from such a course are equivalent to the inconveniences which it would certainly involve? In answer to this we may state, that we believe it to be impossible to treat the sick poor of a great city anywhere except near their homes, at least those of them who are most seriously ill, and who, as we have contended all through this Report, are more especially the objects of treatment in our large hospitals. The experience of St. Thomas's Hospital is in point on this matter. The removal of the hospital from the Borough to the Surrey Zoological Gardens in Walworth was a much less extensive change than the one we have supposed. The new hospital was within walking distance of the situation of the old one, so that no country journey and railway fare prevented the patients being visited by their friends. Yet the change in the class of cases is manifest, as is also the increased pressure upon the beds of Guy's Hospital. Now in any scheme for a country hospital to receive the patients of a city, there must always be left in the city a depôt for the acute cases and grave accidents not admitting of the transit. The pressure upon the resources of this latter would therefore increase; and above all, if fever were received, there would be much risk of its becoming a fever house only, or only a fever house with a separate department for accidents. The country department would then become what our county infirmaries now too often are, viz., a receptacle for chronic invalids; and the acute non-febrile cases would be left without hospital accommodation. This would be a very grave evil, nor is it easy to be satisfied, from our investigations, that it would be compensated by any corresponding benefit. If it seems probable that

Convalescent hospital.

hospital diseases are relatively as common and recovery neither more certain nor more speedy in the country than in the town, to what purpose should the hospital be moved, and its existence as a school of medicine and surgery be thereby endangered?

There is, however, another view of the question, which is well worth consideration, and which we are glad to say is now obtaining the prospect of practical experiment, viz., the advantages to be derived from attaching a country department to a large London hospital, partly as a subsidiary hospital, and partly as a convalescent charity. The effect of this would probably be not only different from but even opposite to that of removing the bulk of the hospital into the country, and leaving only a small receiving house in town; for patients, knowing that they would have the option of remaining in town if they chose, would of course be attracted by the offered alternative of a gratuitous sojourn in the country. Again, the opportunity of sending away from the metropolitan hospital a large proportion of the less urgent cases would enable the governing body of the hospital to relieve the same number of patients, with a considerable diminution of the number of beds in the chief hospital. Now if our hospitals present one defect more conspicuously than another to the eyes of an attentive observer, it is that of overcrowding. We believe that at most hospitals (metropolitan and rural, particularly the latter,) the beds are too close together. The proposed scheme would give an opportunity to remedy this defect, while it would withdraw the less seriously affected patients from the influence of the hospital diseases which prevail among a number of severe surgical cases, and of the fevers which most of our metropolitan hospitals admit. On every ground we think the experiment well worthy of a trial, and we have much pleasure in quoting from a report issued by a committee of the governors of St. George's Hospital, appointed to consider the question of founding a convalescent, or, perhaps, we ought rather to say, a subsidiary hospital in the country, in connexion with that hospital. The committee recommend "the foundation of an institution that possesses " all the requirements of an asylum for the convalescent, whilst it " embraces those of a convalescent hospital to which patients whose " cures have not been completed can with safety and advantage be " removed, where their cures would by change of air be accelerated, " and where, in many instances, cures might be effected of diseases " and accidents which when left in London might terminate otherwise, and where persons recovering from infectious diseases might " remain until all danger of carrying infection to their homes had " passed away. The advantages of such an institution would not " be limited alone to those patients more immediately benefited by " it, but the beds in the hospital would be much more rapidly " emptied than at present, thus enabling a larger number of patients " to be treated without an increase of expenditure. In fact, such an " establishment would in reality be a portion, so to speak, of the " hospital, in the country.

" It is quite unnecessary in the present day to put forward any " arguments as to the expediency of a certain class of cases, or rather " of diseases and accidents in certain stages, being treated in the " country rather than in London, however well a hospital may be " located. Even in Saint George's Hospital, unrivalled for its situation in this or any other city, in a ward well placed for air and " ventilation, one of the scourges of surgical disease (phagedæna, " sloughing of sores and wounds,) has been exceedingly prevalent

"during the past season.*. To be enabled to send patients away for "the further treatment they may require when such a disease makes "its appearance would certainly result in the saving of many lives."

It is quite possible that some such plan as this will be found to be the best method of uniting the advantages of both town and country situations; but the scheme is as yet untried.

Hospitals for consumption are probably beneficial in treating a class of cases which require a higher and more uniform temperature than is quite consistent with the free ventilation which seems necessary for the salubrity of a general hospital for acute diseases.

There are other classes of institutions founded for the treatment of special diseases; but as in a sanitary point of view they are unimportant we have not here spoken of them. It is no want of charity to say of most of such special hospitals, that they are founded to serve private ends, and neither have nor were intended to have any beneficial influence on the public health.

Of the hospitals receiving a special class of patients, the most important are the hospitals for children and the lying in hospitals. As to the former, we believe that in a hospital system which at all approaches or indeed aims at perfection they are essential. The perfection of the system of hospitals would be, as it seems to us, that which would effect for the whole population what the Parisian system aims at doing for the Department of the Seine, that is to say, to afford refuge and medical treatment to all the poor who are afflicted with grave disease. How large a proportion of these are infants we need not say, nor how important a focus of contagion their diseases are to the rest of the community. Children's hospitals.

The most considerable institution for the hospital treatment of children in London is the Hospital for Sick Children in Great Ormond Street; but in speaking of this hospital, and in using it as an illustration of the interesting question relating to the expediency of treating children in special hospitals, we must remember the peculiar circumstances of this institution, particularly its small size, its being situated in a private house, its having no separate building for fever cases, and its being dependent on its subscribers, and therefore compelled to adhere very strictly to the letter system. The question of having special hospitals for children has been rather warmly debated lately in Paris. Some medical men there have contended, in opposition to the strong convictions of the administration, that the institution of children's hospitals is a mistake, for that such places become centres of contagion, from which the exanthematous fevers, and other infectious disorders, to which children are so liable, are propagated to patients admitted for other diseases, to the great loss of those lives which the hospital was founded to preserve. M. Lefort, in a tract comparing the hospital systems of England and Paris, supports this opinion by his own experience of the fatal spread of eruptive fevers, when he was discharging the duties of interne at Sainte Eugénie, a hospital of which he says, "Les fièvres éruptives y règnent en permanence;" and M. Husson, in his Étude sur les Hôpitaux, while

* This is not very accurately stated. Phagedæna attacked some patients in this hospital (19 in all), not in any one ward, but in most, if not all, the surgical wards, though chiefly in the one which received the greatest number of operation cases. But phagedæna at the same time also attacked a far larger number of persons (40 in all) outside the hospital, who were afterwards admitted on account of the disease, and 33 who were treated as out-patients. See an account of this outbreak in the British Medical Journal, March 5th, 1864, by Mr. Pick, house-surgeon to the hospital.

Children's hospitals.

combatting the general conclusion, admits that the mortality at these institutions in Paris has been very considerable, and dwells upon the measures adopted by the administration to withdraw the convalescent patients from the morbid influence by sending them out of Paris. But it must not be forgotten that no efficient arrangements are made at Paris for isolating these cases of eruptive fever. Not even separate wards are provided. Now we think there can be no question that in a children's hospital there should be not only separate wards for infectious cases, but a total and rigid separation between each class of such cases. When it is considered how prone children convalescing from one fever are to contract others, and how utterly impossible it is to prevent them, when able to run about, from visiting each other's beds, it must be allowed to be unjustifiable to expose the patients with measles or typhoid to the poison of scarlatina, or vice versâ. The sanitary circumstances of the hospitals at Paris, however, must not be omitted from the argument. The Children's Hospital in London is defective (as above pointed out) in many of the requirements of a hospital for the reception of febrile and other acute disorders; but still it fulfils the chief conditions of hospital construction, as we understand them, better than Ste. Eugénie or the Enfants Malades at Paris; and the spread of fever in the hospital, though doubtless more than will be the case when an entire separation shall be effected between the general and the fever wards, is yet not so great as to balance the other indisputable advantages of an institution where everything is specially devoted to the study and the treatment of the numerous peculiarities of children and of their diseases.

The other two plans of treating sick children are, to make separate wards for them in a general hospital (as at Charing Cross and the London Hospital), or to admit them into the general wards. The former plan is certainly liable to most of the objections which have been made to special hospitals; and only a few children can be thus accommodated; but if the exanthematous fevers be separated and placed about in the general wards, or in separate chambers, no sanitary objection seems to lie against it. The latter is the plan now generally adopted in London and in the country; but only a few children are or can be thus admitted. Now, the prevalence of acute disease in early life is very great, and the mortality of such diseases in the patients' own dwellings is extremely high, without taking into account the mortality each case indirectly causes by contagion, so that, if any serious attempt is to be made to use the hospital system for the preservation of life on a large scale, a great number of cases of fever in children must be treated in hospitals. But for this our present general hospitals are wholly unfitted, nor would it be right to expose their inmates to the risk of contagion, necessarily involved in nursing a child sick with scarlatina or other febrile affection, which, be it remembered, is quite another thing from lying in the next bed to an adult patient suffering from the same affection. We contend that, for children as for adults, the hospital ought to be the place for the treatment of every disease, and particularly the most acute, and if this is to be the case, special children's hospitals, provided with separate and detached portions for the most contagious affections, will be found to be necessary.

But the practice of the Hospital for Sick Children at London shows that a moderate number of children can be treated in a separate hospital, even unprovided with some of the arrangements that such a hospital ought to have, without the excessive mortality alleged to affect the children's hospitals in Paris.

As to the diseases treated, the practice in existing children's hospitals varies greatly. Those in Paris are both general hospitals and asylums or convalescent institutions for scrofulous children. That in London fulfils only the functions of a general hospital, and those at present incompletely, since the regulations exclude accidents. In Liverpool, on the other hand, there is a small hospital for children; but as infectious diseases are excluded, the cases are chiefly chronic surgical, while at Edinburgh there is no surgical department whatever. We believe that the general plan of the London institution is, on the whole, the best; viz., to make the surgical the subordinate part of the hospital, but not to suppress it entirely, while as to chronic scrofulous cases, they are best treated at special institutions in the country.

As regards lying-in hospitals, it seems to us, from considerations which are discussed in the section on the health of hospitals, that they are undesirable, and that the appropriation of wards to the reception of puerperal women in general hospitals is specially to be condemned. It is of course possible that certain circumstances may in some places (as is said to be the case in Dublin) render a lying-in-hospital, like a workhouse, a necessity; and it is also possible that certain cases, in which special dangers are to be apprehended at the time of delivery, would be safer in an institution where they could be more carefully watched than at home; but these are exceptional cases, and do not furnish valid arguments against the general opinion we venture to express.

It appears to us to be beside our task to speak of military hospitals. We have visited a few, but as we have not had either time or authority to go fully into the question of the sanitary condition of army hospitals, we have not given any details with respect to those we have visited. We may say nearly the same of naval hospitals.

Treatment.

The remarkable changes which have taken place, especially during the present century, in the treatment of many forms of disease, and more particularly in the treatment of fevers and other acute affections, have, it is well known, been regarded by some writers as the necessary consequence of changes in the type of diseases, and of changes in the constitution of those who are affected by them, but by others (and in our opinion with reason) have been looked upon as the expression chiefly of altered medical opinion and altered fashion. By the former party it has been customary to refer, in confirmation of their views, to the differences which have been supposed of late years to prevail between the plan of treatment followed in town hospitals and the plan pursued in the hospitals of rural districts. While for some years past in the hospitals of London and in those of large provincial towns depletion has fallen into disuse, and has been replaced by a nourishing and stimulating plan of treatment, it has been supposed that in rural infirmaries depletion has to a great extent maintained its ground; and it has been thence argued that the naturally robust constitution of agricultural labourers necessitated in the treatment of their diseases an entirely opposite plan to that which was found imperative in the treatment of the same affections occurring to the less robust denizen of a large town. In other words, it has been supposed that some such difference in the constitution of diseases and of individuals obtains at the present day between town and country as has been assumed to exist between the present epoch and that of fifty years ago. It is neither our province nor our intention to enter upon the very wide question of how far and in what manner the treatment of any one

Treatment.

form of disease may need modification according to peculiarities it may present. But we regarded it as an item of our duty to make inquiries at each institution we visited as to the general character of the treatment adopted, feeling, that although, in a comparison of the healthiness of hospitals, the effect of any special skill or knowledge which one medical man might possess above another might be safely disregarded, such radical differences as those which exist between the stimulating and the depleting plans of treatment could scarcely fail to exercise some at least appreciable influence over the result. Our report will show conclusively that the broad distinctions which were once supposed to exist, and doubtless once did exist, between the practice of the medical men of town and country, exist no longer. Depletion, in the exaggerated form in which it formerly prevailed, has ceased to be the rule of practice in every hospital or infirmary which we have visited; and the employment of stimulants and nourishment in the treatment of acute affections has become everywhere habitual. We do not mean to assert that bleeding is never had recourse to; that antimonials and mercury and other depressing remedies are never used; neither do we mean to assert that stimulants are generally given in the quantities which recent enthusiasts have deemed essential. But we mean that as a rule depressing plans of treatment are followed rarely and with extreme caution, and that stimulants are administered freely and without fear, even in cases in which, not long ago, their administration would have been regarded as dangerous; and that the principles of treatment, and the actual treatment, are both as nearly as possible identical in all hospitals, whether of town or country, whether English, Scotch, or Irish.

Again, as regards the local treatment of wounds, whether dependent on operations or other causes, we have found little difference, except in detail. Water and other simple dressings are, with scarcely an exception, habitually employed. For the purpose of cleansing sores, sponges, lint, tow, cotton wool, and irrigation are all in use. As there is little doubt that the poison of hospital diseases can be and has frequently been conveyed from one patient to another by means of dressings and articles used for cleansing wounds, it is obviously of great practical importance that no risk from these sources should be permitted. It is satisfactory, therefore, to find that sponges, which can be so easily used indiscriminately for various patients, are gradually falling into disuse; and that tow and cotton wool, and the like, which must necessarily be destroyed after one application, are coming more and more into fashion. It may be stated, that even in those institutions in which sponges are still employed in the wards, there is almost invariably a rule to the effect that each patient needing a sponge for the cleansing of a wound or sore shall enjoy its exclusive use, and that the sponge shall subsequently be destroyed or purified by some chemical process. The above remarks apply solely to British hospitals.

Diets.

As we have endeavoured to show, the general aims and methods of medical treatment do not appear to vary in various parts of the kingdom, as far as hospital practice affords a test. So that it would be unlikely that any considerable difference should be found in the diets of patients. Everywhere the same circumstance is stated by hospital officials, and appears from hospital documents, viz., that the allowance of stimulants is becoming every year more liberal; and it would be strange if the allowance of aliment were not in proportion. The table, however, which is on page 486, will show that, except for

individual and accidental differences, there seems little variation in the diets of London, the large towns, and the country, unless it should be thought that the proportion of meat is somewhat higher in London, and that of bread in the country. It should also be remembered that extras are very freely ordered in those hospitals, both in London and elsewhere, which receive a large proportion of urgent cases.

The comfort and welfare of patients in hospitals (or elsewhere) depend in no small degree upon the amount and kind of nursing which they receive. The good which a good nurse is capable of effecting, and the evils which result from the employment of careless and incompetent nurses, cannot be expressed numerically, but that they are very considerable is unquestionable. The truth of this every one competent to form an opinion has always fully conceded; but to Miss Nightingale is undoubtedly due the credit of having taken measures to improve in a variety of ways both the systems of nursing and the quality of those who have to perform the duty of nursing. A cursory examination of hospitals, such as in many instances we have been compelled to make, does not afford sufficient opportunity for judging positively of the effects of the different systems of nursing prevailing in different institutions. We have found, however, arrangements as regards nursing in some hospitals which are obviously greatly to be deprecated, and arrangements in some few, which, on the other hand, deserve sincere commendation. Thus we have found that here and there the number of nurses is insufficient; that in many institutions nurses are expected to do the scrubbing, and to perform other menial duties; that in some cases, again, they live out of the house; that in others, though residing in the hospital, they are expected to provide their own food. And we have found that in a few hospitals the nurses are really in all respects well cared for; and, further, that training establishments for nurses have been instituted. We do not propose to discuss at length the question of nursing, but simply to give our opinions on certain points in regard to it which have impressed themselves upon us in the course of our inquiry.

1. We need perhaps scarcely express the opinion, that nurses of civil hospitals (except possibly in certain special cases) ought to be women. The peculiar instincts and moral qualities of the female mind especially adapt women for ministering to the wants of the sick.

2. The duties which nurses have to perform are important duties, and ought only to be entrusted to women of a certain character of mind. A fish-fag, a hawker, or any person habituated to a coarse or debasing kind of life, is evidently neither by education nor habit fitted to become a nurse.

3. But neither is every woman of refinement suited to fulfil the functions of a nurse. She may have a dislike to the work, and if so can scarcely be expected to carry it out properly; or she may be devoid of some of those special feminine attributes which combine to constitute the thorough nurse.

4. No woman, however admirably adapted by nature to be a nurse she may be, can be an efficient nurse without some experience, or some special training.

DIET TABLES.—ORDINARY DIET FOR MALES.

		Meat.	Bread.	Potatoes.	Tea, Coffee, or Cocoa.	Butter.	Milk.	Gruel, Pottage, &c.	Beer.	Soup or Broth.	Cheese.	Pudding.
Metropolitan	Royal Free	10 ozs.*	12 ozs.	8 ozs.	1½ pint	—	½ pint	1 pint	Extra	—	—	—
	University College	8 ozs. alternate days.	1 lb.	8 ozs.	—	—	½ pint	1 pint	—	1 pint alternate days.	—	—
	St. Mary's	4 ozs.†	12 ozs.	8 ozs.	2 pints	¾ oz.	3 ozs.	—	Extra	—	—	—
	Middlesex	6 ozs.*	12 ozs.	8 ozs.	—	—	½ pint	1 pint alternately.	Extra	1 pint alternately.	—	—
	Guy's	4 ozs.†	12 ozs.	8 ozs.	—	1 oz.	—	ad lib.	½ pint	½ pint alternately.	—	½ lb. alternately.
	Westminster	4 ozs.†	10 ozs.	12 ozs.	—	—	—	2 pints	Extra	—	—	—
Provincial	Liverpool Southern	6 ozs. or lobscouse.	ad lib.	ad lib.	2 pints	—	—	—	Extra	ad lib. alternate days.	—	—
	Bradford	6 ozs. alternately.	ad lib.	ad lib.	1 pint	ad lib.	1 pint	1 pint	Extra	1 pint alternately.	—	—
	Bristol General Hospital	4 ozs.	12 ozs.	4 ozs.	1½ pint	—	½ pint	1 pint (or bread and milk).	Extra	—	—	—
	„ Royal Infirmary	6 ozs.	12 ozs.	6 ozs.	—	—	½ pint	—	—	—	—	—
	Exeter	4 ozs.	14 ozs.	8 ozs.	Extra	About ½ oz.	Porridge 1 pint.	—	1 pint	1 pint	—	—
Rural	Lincoln	6 ozs. alternately.	ad lib.	ad lib.	2 pints	1½ oz.	ad lib.	—	Extra	1 pint alternate days.	—	—
	Hereford	4 ozs. alternate days.	1 lb.	ad lib.	1 pint (or broth), tea 2ozs. a week.	6 ozs. weekly.	ad lib.	1 pint	1 pint	ad lib. alternate days.	1 oz.	—
	Gloucester	4 ozs. alternate days.	17 ozs.	6 ozs.	Extra	—	1 pint alternately.	1 pint alternately.	½ pint	1 pint alternately.	1 oz.	—
	Norwich	6 ozs. alternate days.	14 ozs.	ad lib.	2 pints	¾ or 1½ oz. alternately.	ad lib.	—	1 pint	1 pint alternately.	2 ozs. alternately.	10 ozs. alternate days.
	Portsmouth	6 ozs.	14 ozs.	8 ozs.	2 pints	1 oz.	ad lib.	—	Extra	—	—	—
Scotch	Aberdeen	In soup.	10 ozs.	In soup	½ pint	—	1 pint	½ pint	Extra	1 pint	—	—
	Dundee	4 ozs.	1½ lb.	—	2 pints	—	—	—	—	1 pint	—	—
	Dumfries	8 ozs.*	4 to 6 ozs.	Some with the smaller quantity of bread.	—	—	1½ p.=6 gills	12 gills	—	1 quart	—	—
Irish	Dr. Steevens's	8 ozs.	1 lb.	—	2 pints	—	—	—	—	1 pint	—	—
	Adelaide	12 ozs.	18 ozs.	—	2 pints	—	—	—	—	—	—	—

* Uncooked. † Cooked.

Assuming the truth of what has just been asserted, assuming also (what is in fact unquestionable) that competent nurses are required in large numbers by hospitals and infirmaries throughout the whole of Great Britain, we arrive strongly at the opinions—

1st. That nurses should be specially educated. It is only of late years that medical men have been required to undergo a course of instruction in a hospital, and at the present time it is acknowledged that no man is competent to act as a physician or surgeon who has not been specially educated for the purpose; and further, that no large hospital is efficiently worked without it has associated with it a class of medical students. All this is applicable to the question of nursing. Nurses have not, it is true, been hitherto specially educated; but they ought to be educated; they ought to be educated in hospitals, where alone they can have adequate instruction; and we are satisfied that this course, systematically pursued, will gradually tend to elevate the character and position of nurses, and that a school of nurses will bring with it to the institution to which it is attached analogous advantages to those which accrue from a school for the education of medical pupils. The Nightingale fund has for two or three years past been partly expended in a system of educating nurses at St. Thomas's Hospital. The plan has succeeded admirably well in that institution; and we are bound to add, that in the course of our visits to the provincial hospitals we frequently met with nurses who had received their education there, and we were invariably assured that these nurses were in all respects far above the average of ordinary hospital nurses. An institution for training nurses has been established in connection with the Liverpool Royal Infirmary.

2nd. That nurses should be relieved of all duties but those strictly belonging to their office; that, for example, it should be no part of their duty to perform the functions of a scrubber; and that they should not be expected to do more work than common sense and experience shows that they are physically capable of doing efficiently.

3rd. That they should live on the premises and board there; and that they should be thoroughly well cared for.

We may add, that we are equally of opinion that private nurses (of whom vast numbers must be needed) should receive a hospital education. A training establishment for such nurses has been established at the Bath United Hospital; and we hope to see the day when most of our large hospitals shall have attached to them, not only medical schools, but schools for the education of both hospital and private nurses.

The table on the following page shows the number of nurses, in proportion to the number of patients and of wards, which have been found necessary in hospitals in various situations and receiving cases of varying severity.

NUMBER of NURSES in various METROPOLITAN, PROVINCIAL, and RURAL HOSPITALS, compared with the Number of PATIENTS and that of WARDS.

	Name of Hospital.	Number of Beds.	Average Number occupied.	Number of Wards.	Day Nurses.	Night Nurses.	Remarks.
London	University College	115	110?	8	16	8	There is also a lady-sister in each ward. Special nurses are hired as wanted for the private wards.
	The London	457	364	31	About 40 *	About 15	Each of the six large wards (containing 50—70 beds) is under one head nurse, with an assistant under her for each portion, four or five, according to the size of the ward. This makes 31 day nurses, and there are 12 night nurses for the same wards. The additions for the other wards are made in proportion.
	King's College	147	130	13	13	13	To the day nurses must be added a lady superintendent, and about six lady sisters and nine probationers.
	Royal Free	100	100	4	7	3	There are also always some occasional nurses.
	Guy's	574	494	22	47‡	28	
	Westminster	191	154	18	21‡	Altogether	
Provincial	Aberdeen	229	125	26	22	Altogether	Each day nurse, as a rule, attends to two wards.
	Dundee	170	About 140	12	About 12 *	About 6	
	Edinburgh	519	380	48	30	33	This number of nurses refers to the time of visit when some clinical wards were closed and there was little fever. At other times the number is even higher. The large number depends, we were told, on the number of small wards. Besides the 48 regular wards there are 10 private rooms.
	Birmingham, Queen's	135	—	16	About 20	About 5	
	Bristol Royal Infirmary	236	208	17	34 *	Altogether	The total number of beds refers to the 17 wards in constant use. The garret wards are only occasionally used, and then separate arrangements are made for the nursing.
	Liverpool Royal Infirmary	230	189	20	25	7	
	Barnstaple	74	About 65	9	3	—	
	Bury St. Edmunds	84	About 65	10	9†	Altogether	A night nurse is hired when wanted.
	Cambridge	102	78	11	10†	—	Night nurses are hired as wanted.
	Canterbury	120	About 93	16	8‡	Altogether	
	Cheltenham	92	57	8	8†	—	The number of wards is that of those in use. There are no night nurses, except occasionally one hired from the town.
Rural	Chichester	56	About 45	7	2‡	2	Here only the wards at present in use are reckoned.
	Exeter	233	155?	26	15‡	Altogether	Extra nurses and additional night nurses are hired as wanted.
	Gloucester	161	99	9	8*	2	
	Hereford	88	70	16	4	—	
	Huddersfield	55	43	10	3‡	1	
	Lincoln	101	80	15	6	Vary.	As many night nurses hired as wanted.
	York	84	57	8	5†	1	There are four double wards. Each portion is here reckoned a separate ward as at the London Hospital.

* At these hospitals the nurses assist in cleaning the wards. † At these hospitals the assistant nurses scrub the wards. ‡ At these hospitals scrubbers are hired.

This Table appears to show:—1. That in hospitals of the "rural" class the number of nurses required is about half as many as in metropolitan hospitals, and considerably below what is found necessary at the hospitals of large towns. 2. That this disproportion is further increased by the fact of the nurses having generally in the smallest country hospitals to clean the wards, while in metropolitan hospitals this is generally done by scrubbers. And 3. That in consequence of the large number of small wards contained in most rural hospitals the number of day nurses is usually below that of the wards, and sometimes largely below it; while in the metropolitan hospitals there is always one nurse, and usually several, in each ward during the whole day, and the same is also the case usually in provincial hospitals. This points to the fact that the patients in rural hospitals are most of them able to look after themselves, and many of them are made use of to help their neighbours.

CONSTRUCTION OF HOSPITALS.

Second in importance, as we reckon it, to the regulations of hospitals, but second only to that most essential of all the parts of our subject, comes the question of the construction of hospitals. The construction of hospitals is a matter on which much has been thought and much written of late years; and on which the writings of many persons of practical experience have done much to diffuse abroad sound principles, and to point out many erroneous ideas which have prevailed in the absence of any systematic inquiry into these questions. If in anything which follows we appear to differ from such eminent authorities, such differences will, we believe, be found to be in matters of detail only.

Let the reader never omit from his thoughts this fact, which it is the special business of this Report to impress strongly on the minds of all persons interested in the question, viz. that under the common term "hospital" institutions are comprised which differ so very greatly in their design, that is to say, in the nature of the cases which they admit, that it is unreasonable to assert that any rigidly fixed rules of construction must be applied to each and all of them. Some general principles, however, we believe there are which are applicable to all hospitals intended for the treatment of acute disease, and we believe that the more numerous and the more acute the cases in any hospital may become, the more important is it that such principles should be kept in view in the construction of the building.

We will commence, then, by the consideration of the principles which appear abstractedly desirable in the construction of a hospital for the treatment of acute disease; and proceed to inquire into the different forms of building which satisfy or violate those principles.

The first requirement of a hospital building is that it should be devoted entirely to the service for which it is founded. Architectural effect may possibly be attained, and is certainly not incompatible with good construction; but the latter has been in some cases postponed to the former; and the healthiness and ventilation of the wards have been sacrificed to the taste of the builder for projecting turrets and mullioned windows. Instances of this defect are furnished by the old Bradford and the Liverpool Northern Hospitals.

Objects of a hospital.

A hospital differs from a private house in certain main features; and the chief peculiarities of construction required in hospitals are deducible from such differences:—

In the first place, the inmates of a hospital are persons suffering, or very recently recovered, from more or less acute disease. Hence a large proportion of them are confined to bed, a still larger proportion to their room, and nearly all to the house. From which it follows that the number of persons constantly inhabiting a hospital is far greater in proportion than that of the inhabitants of the private house; for although the houses of the poor in great cities are crowded more densely by far than any hospital, during the night time, yet during the day and in fine weather they are comparatively empty. The air of a hospital is never entirely changed by the withdrawal of the great mass of its inmates, as that of a private house is.

In the second place, the persons who are so confined to a constant occupancy of the wards are labouring under affections which tend to poison the air of the place, either by the accumulation in the wards of the natural excretions, or by the exhalations from large surfaces in a state of acute suppuration, or by the foul odours arising

from gangrenous or unhealthy surfaces, or by the subtle emanation of fevers and other acute diseases, or by these and other impurities combined.

Thirdly, the economy of space and of nursing requires that these sources of danger should be met, not by separating the sick into chambers by themselves (as would on some accounts appear desirable), but by endeavouring to ascertain what are the arrangements, if any, under which a sufficient number of sick can be grouped in one ward without danger.

Fourthly, we must not omit to assign its due prominence to the consideration that a hospital is not only an institution for the treatment of the sick, but also a school for teaching that treatment; and, therefore, that the building ought to be so constructed as to minister all the accommodation required for the instruction of students, for the conducting of post mortem examinations and dissections, and for the compilation of records.

Fifthly, in England at least, almost all our hospitals are intended also to serve as dispensaries, that is to say, as places where the poor can attend in large numbers to obtain medical and surgical advice and treatment, and to procure the medicines prescribed.

These various considerations indicate the leading features of the plan of a well-built hospital.

In the first place, in order that a great proportion of sick persons may be kept constantly in the house without rendering the atmosphere of the whole building pestiferous, it is necessary that fresh air should be supplied in great quantities, and at all times, to all parts of the hospital. This has never been done by any artificial machinery*; but must be a necessary result of the construction of the building considered as a whole. Thus, independent of the ventilation of any parts of the building, the whole hospital requires, as a central stem or axis, a great air shaft, about which all its parts, whether wards or dwelling rooms, ought to be grouped. This air shaft is formed by the staircase and corridors†; and the primary question in hospital construction is, whether any one plan of arranging the building in reference to the staircase and corridors is so far superior to all the others that it deserves universal adoption; and as a converse to this, whether any plans are so bad that they deserve peremptory condemnation.

Pavilion plan.

Now, the leading plans of construction considered with reference to the arrangement of the building around its staircases and corridors we believe to be as follows:—

1. The pavilion plan, by which the interior ventilation of the hospital is trusted to the staircases merely, the hospital being broken

* This assertion may be supported by the following facts:—In the Hôpital Lariboisière, and in many other hospitals at Paris, very beautiful and ingenious systems of artificial ventilation are in use. They appear to effect their mechanical purpose as well as it is possible to do; but the wards are not sweet nor healthy. At the York County Hospital, when it was first built, the whole ventilation was instrusted to similar machinery, the windows and chimneys being permanently closed. The cases treated were mild; yet the hospital became so unhealthy that it was found necessary to close it, until the natural system could be replaced. At Guy's Hospital, the system of artificial ventilation is allowed to be a failure, as far as the sanitary condition of the wards is concerned. At numerous other hospitals (*e.g.* the Bristol General Hospital, the West Kent Hospital, Maidstone, the Liverpool Royal Infirmary, and the Edinburgh Royal Infirmary,) artificial ventilation has been tried and abandoned. At no British hospital is artificial ventilation now used, except as an auxillary to the natural ventilation; and, we may be allowed to add, an auxiliary on which no great reliance is reposed.

† The noble staircases of King's College Hospital and St. Bartholomew's are of the greatest importance in the ventilation of the building.

up into separate blocks consisting of single wards on each story, exposed on both their faces to the air. The blocks are detached entirely, or are connected by external corridors. Examples of this form of construction are hardly to be found in England, as applied to civil hospitals,* unless St. Bartholomew's may be so considered; but the plan of the Lariboisière Hospital at Paris has been so often published in this country, and has excited so much discussion, that it is hardly necessary for us to describe it here. All necessary details will be found in M. Husson's Étude sur les Hôpitaux.

This plan of construction has many most forcible considerations in its favour, and it cannot be denied that it has attendant disadvantages. The absolute separation which it permits between diseases known or reputed to be contagious and those of other classes, the thorough ventilation of all the wards, the extent of ground which it necessarily requires, and which is available for ventilation and exercise, are some of its numerous and important advantages; the distance of parts of the hospital from each other, and the costliness of the construction are almost its only drawbacks,† unless it can be imagined that the extensive exposure to the air would make the building cold. But stout walls, double windows, and good fires will keep out any weather ever experienced in this country. It is objected, however, that the Lariboisière Hospital is notoriously unhealthy, an objection which shows how readily popular rumours are adopted without examination into their details. We hope to show that the bad success which we fear must be allowed to have hitherto attended the practice of this noble hospital is due to quite other causes than its construction, which we believe to be as nearly faultless as it is possible to be.

* The new wings of the St. Thomas's (original) Hospital were constructed on this plan, and the London Fever Hospital might be said to be on the same general plan of construction. The new hospital at Leeds is being built on the pavilion plan. Among military hospitals, the Marine Hospital at Woolwich is constructed on this plan.

† A due regard to economy should always govern those who are trustees for the poor. The amount of money which has been wasted on experiments in hospital construction is almost incalculable. We give three instances only. Compare the expenses of construction of the Hôpital Lariboisière, as given in M. Husson's Étude sur les Hôpitaux, p. 347 (exclusive of purchase of land and furnishing), with the cost of erection of the present building of St. George's Hospital. M. Husson is in error in representing (op. cit. 20.) that the present building of St. George's Hospital includes Lanesborough House which originally stood on its site; this was true of the old hospital, but the present is an entirely new building. The Lariboisière Hospital for 606 beds cost 6,655,215 francs, or, in round numbers, more than 285,000*l.* St. George's for 320 beds was completed "at a cost little exceeding the original estimate of 50,000*l.*" (Report of St. George's Hospital for the year 1860, p. ii.) The land on which the Hôpital Lariboisière stands is far more than double that for St. George's; so that we may say, that two such hospitals as St. George's could have been erected to accommodate 700 patients at less than half the cost of Lariboisière to accommodate 600. This is the expense of the pavilion plan as compared with the H shape. Yet, if the facts we have collected are to be trusted, no advantage attaches to the former over the latter. Again, at Guy's Hospital may be seen an immense tower, serving as an air shaft for an elaborate system of ventilation, which attracts the admiration of all engineers, and has received medals of honour from exhibition juries, but which makes the wards no healthier, or rather leaves them much inferior in salubrity to the original wards, that trust solely to natural ventilation. This system either is, or will be, or at least might as well be, entirely disused. We venture to think that if the complete success which has attended the practice of hospitals in which no such machinery is found had been publicly known this great waste of the hospital resources would not have been incurred. Lastly, as an example of money spent in rendering a hospital absolutely uninhabitable, and only to be remedied by spending more money to undo the mischief of the former expenditure, we may adduce the examples of the York County Hospital and the Bradford Infirmary. We might have given many other examples, but these will suffice.

Block plan.

But though we have no perfect example to produce of the pavilion system as applied to a large civil hospital in Great Britain at present, many of our small hospitals are built, and more might with great advantage have been so, as single pavilions, that is to say, in blocks of wards placed one over the other, exposed on both faces to the air, and having a staircase either at the end, where there is but one ward on a floor, or in the middle, where there are two.*

This plan again may be modified (and so far we fear we must say modified disadvantageously) when space or other considerations render it imperative, by bending the block, as it were, into an angular form, so that there may be wards in each limb of the building.† The chief objections which may be taken to this form of building are, that if one of the limbs has a good aspect the other must have an unfavourable one, and that if there is only one staircase the wards must open out of each other, an arrangement which we shall endeavour to show is undesirable, while, if there are two staircases, they are very inconveniently separated from each other, and in this respect like pavilion hospitals. But it must be admitted that such objections are not weighty enough to counterbalance the arguments which may render this plan of construction desirable.

Some hospitals built essentially on the block plan, have the peculiarity that the block is bent round three sides of a square‡, or even four sides.§ Both plans, especially the latter, have been severely criticised, but the severity appears quite undeserved. No hospital in the world (as far as our knowledge extends) can show better results of practice than Guy's, or treats cases of more gravity; and no hospital appears to fulfil the objects of its foundation better than Haslar, which, be it remembered, is not intended for a general hospital, and receives cases of a lower average of danger.

2. Of hospitals that require interior corridors, but which are arranged on some definite plan around those corridors, the different forms appear at first sight infinite. We must endeavour to reduce them to some method. They separate themselves naturally into two chief classes, viz., those in which the corridors are intended only for the ventilation of the building generally, and those in which the wards are ventilated into the corridors (corridor hospitals, as they are often called).

H shaped hospitals.

The chief type of construction in the former class is that in which the building is of the shape of the letter H. The lateral limbs are the wards; the central limb contains the corridor with a staircase at either end, giving access to the wards on each side of the staircase, and with offices, dwelling-rooms, or sometimes with smaller wards on each side of the corridor. When the latter is the case, the main principle of the building is so far departed from. Instances of this form of construction are very numerous. We could refer to the Middlesex and St. George's of the metropolitan hospitals, to those at Aberdeen, Leicester, and Reading, among the country hospitals.

The other type of construction of this class of hospital is where the central part, which contains the staircases and corridors, has wards springing from each corner, as at Bury St. Edmund's and Montrose, or radiating from each side, as at Perth.

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* Such are Arbroath, Charing Cross, Greenock, Ipswich, Stafford.

† The infirmary at Sheffield is an instance of this plan, as are the Edinburgh (old hospital), and the Royal Free Hospital.

‡ As Bedford, Birmingham, Queen's Hospital.

§ As Guy's, Haslar.

The obvious and very great advantage of these plans of construction is, that they enable the service of a larger hospital than could be built conveniently in a single block to be carried on with efficiency and comfort, while they secure to each ward (when the principle is kept in view throughout), or at least to all the largest wards (when the central part is laid out in small wards), the primary requisite of the most thorough system of ventilation which has as yet been invented, viz., that by opposite windows.

3. We now come to the corridor hospitals, properly so called, as distinguished from the H shaped, &c. These are so numerous in all parts of the kingdom, that it is difficult to believe that all the objections which have been urged against the plan can really be tenable.* There are numerous advantages in connecting the wards together by corridors out of which they open. The plan of building is suitable either to large or small wards, whilst that which insists on each ward having opposite windows and no communication with the corridor, is only possible for comparatively large wards; it adapts itself to all varieties of shapes, while the former is adapted almost exclusively to the two shapes of which examples have been just given, and the various parts of the hospital can be arranged in any proximity to each other that may be considered desirable, while in the other plans the chief parts of the hospital must be separated by the whole length of the connecting part, if the principle is rigidly carried out. But the objection raised against the plan, is that by this construction "the foulair of all the wards must "necessarily pass into the corridor, and from the corridor into the wards 'indiscriminately." We will not attempt to discuss the theory of this objection, although it strikes the reader of it at once that to suppose the foul air to be passing into and out of the same wards, is to assume a fact which, though not impossible, requires proof. But we will rather ask whether it is found to be so†? We cannot say that the inquiries we have made tend at all to support the idea that a hospital with a corridor is, on that account merely, less healthy than one without a corridor, always provided that the corridor itself is well ventilated, that the wards have direct ventilation into it, and that the latter are well constructed. Let us compare the Bristol General Hospital and the Sheffield Infirmary. They do not differ very strikingly in any other particular, except that the Bristol Hospital has a corridor in its whole extent, the other (except in the small part designed originally as a fever house) has not. Yet a comparison of these two hospitals will show that the former is not found to yield to the latter in healthiness, if the results of surgical operation, and the prevalence of hospital affections, be taken as the test of healthiness. Or, let us look at the plan of the noble hospital at Dundee. There the corridors extend along the whole of the building; but from their admirable arrangements and free

Corridor plan.

* The following may be referred to as examples of corridor hospitals:—The Westminster Hospital, Bath (new building), Belfast (Fever and General Hospital), Carlisle, Chichester, Edinburgh (new hospital), Hull, Lincoln, Liverpool (Northern and Southern), Manchester, Newcastle, Northampton, Nottingham (this latter mixed and confused, Class 4.), Shrewsbury, Stafford, Taunton, Wolverhampton, the Whitworth and Rotundo, at Dublin.

† The Mater Misericordiæ Hospital at Dublin is an example of a corridor plan to which no theoretical objections can, as it appears to us, be taken. The ward has a single row of beds, and opens into a corridor at least half its own width, into which it has free ventilation. All the parts of the hospital are wide, lofty, and well ventilated. The plan appears as good as could be adopted, apart from questions of economy, for it must necessarily be expensive. The same may be said of Dr. Steevens's Hospital, Dublin.

ventilation, the wards altogether appear to be in perfect order, and there is, to say the least, not the slightest proof of the conveyance of any air, foul or otherwise, from one ward into another. Again, look at a hospital of much older, and it must be allowed less perfect, construction, the Royal Infirmary at Bristol. It would be difficult, we believe, for any person who visits this hospital to persuade himself that the large open roomy corridors, which are themselves so perfectly sweet and fresh, can be the source of impurity to the wards. We venture, therefore, to believe that the objection to a hospital constructed with corridors has been somewhat exaggerated, and that, provided the ventilation of the corridors themselves is perfect,* that of the hospital may be for all practical purposes complete, and that this is shown to be so by the successful results of practice in hospitals so built where urgent cases have been treated with success for a long series of years. But in order that this may be so, the ventilation of the corridor itself must be perfect. This end is secured in various ways in well-constructed hospitals. In the first place, if the corridor be placed in the centre of the building, it is more difficult to establish a satisfactory ventilation. Two plans are in use. Either the corridor must be very wide in proportion to its length, and have large windows at either end constantly open (Bristol Royal Infirmary), or it must be carried up the whole height of the building, thus dividing it into two separate parts, each opening into the corridor by landing places (Liverpool Southern Hospital), which may be connected by light bridges.

But it is much more desirable to place the corridor at one side of the building, so that only one set of wards open out of one side of it.† Then ventilation is easily secured as at Dundee by placing the windows of the corridor and those of the wards directly opposite each other, or as at Netley, the corridor may be freely open to the air; or as in some of the wards of the old part of the Edinburgh Royal Infirmary, and at University College Hospital, the corridor may be made to extend only a part of the height of the ward, so that the latter may have windows above the corridor. The same is the case in the London Small-pox Hospital.

Where the wards are small and close, and the corridors are long, narrow, irregular in direction or shape, and ill-ventilated, we believe it to be true that they do oppose a very considerable obstacle to the free ventilation of the wards, and have a direct tendency to the production of hospital diseases; and these defects of construction may, we believe, be traced to have had some such influence in hospitals like those of Leeds, Lincoln, Manchester, &c.

Other plans.

4. There are a great number of hospitals which approach more or less closely to these principal types, without, however, having sufficient regularity of construction to be referable to any of them.‡ To all these we believe the general observation may be applied, that by as

* The evils of ill-ventilated corridors communicating with small wards and probably having little communication even with them, except by the doors, are illustrated by the history of the Manchester Infirmary. But in dwelling upon the great mortality of that institution, the cardinal fact has been overlooked that this is one of the few large English provincial hospitals which receive every acute disease, including even small-pox; and that severe injuries are more than usually common here. Still we cannot help recording our conviction that a number of very small wards, arranged on both sides of long corridors, is one of the worst forms of hospital construction.

† This is the case at the Mater Misericordiæ and Dr. Steevens's Hospital.

‡ Such is that at Exeter, which resembles the angular block plan; but is not a pure example of it, inasmuch as many of its wards have not thorough ventilation, and many other country hospitals, which have been built piecemeal, as occasion required or funds permitted.

much as they depart from the main idea of their construction, by so much they lose either in convenience or healthiness.

5. Lastly, there are a considerable number of small hospitals in the country as well as in London,* which either resemble or actually are large private houses. We believe that what we have said above is sufficient to show that such edifices are little fitted for the purposes of a hospital, considered as a place for the reception of large numbers of acute cases, constantly resident in the wards; and that if acute cases are to be treated with all the success possible, or, which is the same thing, if the best possible medical treatment, that first and most essential requisite, is to be assisted by all the aids which experience has suggested, some more efficient arrangements for the ventilation of the whole building than are ever found in private houses must be adopted. At the same time, the experience of numerous country infirmaries shows that chronic cases, with a small mixture of acute diseases and accidents, can be treated with great success in buildings even worse arranged in these respects than the most roomy of our private houses are.

Arrangements of wards.

Let us now turn to the second of the considerations above mentioned, as regulating the construction of hospitals as distinguished from private houses, viz. that the persons who occupy the wards are labouring under affections which tend to poison the air of the place; and therefore, that special and distinct provision must be made for the general ventilation of the wards, and also for the speedy removal, if possible, of all sources of foul air, or for their neutralization when they are not removable, or at the worst for the greatest attainable safety of other patients, when it is necessary to receive and to keep in the general wards cases which give rise permanently to morbid exhalations.

Ventilation.

These objects can only be attained by the most minute attention to the arrangements of the wards. In the first place, with regard to general ventilation. If the hospital have been constructed with proper regard to spaciousness, on any of the three first out of the five plans mentioned above, *i.e.*, on the pavilion or block system, the H shape, or on the corridor plan (with the cautions which that plan requires), there will be no difficulty in obtaining a thorough ventilation of the wards by the only system which has as yet been found to effect its purpose; that is to say, by windows opposite each other. That these windows should be kept open, partially at least, during the whole of the daytime in mild weather, is a point on which British hospital authorities appear to be agreed; and we can have no doubt, from the unanimous testimony that we have received from the resident officers of hospitals all over the kingdom, that they are correct in ascribing the very remarkable freedom which is displayed by our hospitals from erysipelas and the allied affections in the present day, as compared with what we know, and have reason to believe, of the condition of the same hospitals in past times, mainly to the habit of keeping windows open during a great part of the day. This habit has commenced in comparatively recent times, and is still on the increase. Should the windows be kept open also at night? Here again, the testimony of numerous hospitals leads us to the belief, that in the majority of cases this ought to be done.† We would refer to the experience

* Such as the Hospital for Sick Children at London, Bath (old building), Cambridge, Canterbury, Colchester, Derby, Dover, Lancaster, Paisley, Portsmouth, and Salisbury, Jervis Street, and several other hospitals at Dublin.

† Reference may be made on this point to the experience of Birmingham Queen's Hospital, Bristol General Hospital, the Margate Sea-bathing Infirmary, and many others.

of the Leeds Infirmary, where all the windows are kept open to a slight extent permanently, and where the evils produced by overcrowding and bad construction of the wards are in part remedied by this constant supply of fresh air.* Instances of the converse proposition, viz., that wards cannot be healthy without a thorough natural ventilation, are unhappily only too easy to find. Thus, in all the hospitals at Paris, with very few exceptions, the windows are kept shut during the whole day and night, except for a short time in the morning, when they are opened in order to discharge the accumulated impurities, and free the ward from hospital odour before the hour for the early morning visit. The consequences of such a system are what might have been predicted. It is in vain that the magnificent hospital of Lariboisière has been constructed at a fabulous expense, with all the appliances that modern science, and unlimited generosity could furnish, with the costliest systems of elaborate artificial ventilation, and with the still more precious advantage of a row of opposite windows to each ward ensuring a constant supply of pure air, if they were made use of. Partly from a few minor defects, which we shall have occasion to touch on elsewhere, but mainly from the fact that the natural system of ventilation for which such elaborate and efficient provision has been made, is never put in practice, this beautiful, clean, and spacious hospital, which is never, or very seldom overcrowded, remains to the opprobrium of the modern hospital science, of which we have lately heard so much, a far worse place for the treatment of injury, and no doubt of diseases also, than the old infirmary at Leeds, crowded as that infirmary is with the many victims of accident in that great manufacturing town, and full of every fault of construction which can be united in the same building, and far too small for the number of patients whom it is found necessary to receive.

But the ventilation of a ward depends besides on other matters than the position of the windows and their being kept open; it is necessary that the windows should be of proper shape, size, and construction, and that there should be no obstacles inside the ward itself to the free circulation of the air. Windows which are so broad as those at Lariboisière are necessarily placed at so considerable a distance from each other that the beds must be arranged in pairs, and the same plan is followed at a great number of the hospitals of modern construction, the designers of which have no doubt had the model of this splendid hospital before their eyes.† Yet there can be little hesitation in saying that the close proximity of any one bed to any other is to be avoided on all grounds. Without going here into the contagion theory, we may confess ourselves unable to resist the conviction that exhalations do arise from diseased bodies, which extend a greater or less distance, according to the nature and the severity of the disease or injury,—a

* That overcrowding and bad ventilation may cause hospital diseases, irrespective of the situation of the hospital in which such vices exist, and even in hospitals which deal with comparatively light cases, is shown by the history of many of our hospitals; and the more convincingly, as some of those summaries testify to the removal of such diseases by the removal of their presumed causes. We will name a few:—In the Newcastle Infirmary we have an instance of imperfect ventilation and somewhat faulty construction co-existing with a good deal of pyæmia; in that at Salisbury of crowding and imperfect drainage acting apparently as causes of erysipelas; in the Manchester Infirmery, of improvements in ventilation, in waterclosets &c., being followed by a diminution of hospital diseases; in the Worcester Infirmary, of erysipelas and phagedæna, produced by overcrowding and deficient ventilation, and cured by remedying those defects. Others are referred to in different parts of this Report. (see Health of Hospitals, pp. 547–49.)

† Such is the case in the hospitals at Leicester and Oxford.

distance which cannot be measured perhaps with a foot line, but which renders the immediate vicinity of a bed where a case of small-pox, exanthematous or acute fever, large and acutely suppurating wound, gangrene, &c. is placed the most dangerous part of the ward for any other persons to live in. For this reason we would dissuade the adoption of that form of ward wall in which the beds are arranged in pairs between each pair of windows. Another disadvantage in this construction is that the interval between each pair of beds, where the morbid exhalations must be in the greatest quantity, is just that spot where the ventilation must be the most feeble. We give the preference by far to any construction of the ward wall, even if somewhat irregular, in which the beds are removed from each other by intervals of not less than six feet.*

Cubic space.

The cubic space allowed to each bed is a matter which is intimately connected with the distance at which the beds are arranged. It is of great importance that the cubic space should not be below a certain minimum, which in hospitals intended for the reception of numerous urgent cases may be taken at about 1,200 feet. But the cubic space allowed in the whole ward may be ample and yet, from ill arrangement of the ward, the beds may be crowded; even to such a point as to produce unhealthiness of the wards. Thus, in the old hospital at Bradford (now remodelled) there was not less than 1,200 cubic feet per bed in any ward, yet the beds were crowded, and the wards close and unwholesome.†

Windows.

The windows ought to go up to within a very short distance at least of the ceiling, otherwise the whole space of the ward is not available for fresh air. The lofty vaulted wards of some of the old hospitals in Paris have indeed a striking and noble appearance, but it may be doubted whether the upper part is of any real use to the patients, while the great height is an obstacle to the construction of stories above.

The construction of windows is not less important than their size. It is very probable that the horror entertained of draughts in Paris (a horror which to us who are accustomed to see our patients living with windows constantly open, and feeling no sort of inconvenience, appears rather comical,) depends in some measure upon the difference between the windows in use here and there. To open the upper part of a sash window of any form is a very different thing from opening a French "croisée." To put open the whole of such a window (as was done at the time of our visit in some of the surgical wards at La Pitié) has very much the same effect as laying the patients nearest the window out in the open air, and the window cannot be otherwise put open except by leaving the fastening half secured, in which case a thin current of cold air comes through the whole vertical extent of the window, and falls with merciless severity on any bed which happens to lie in its line. They are, we believe, the worst form of windows for hospital purposes.

* We are speaking throughout of wards destined for the treatment of acute disease. A much less space is perfectly sufficient for chronic cases and for patients who are many of them out of bed. For instances of wards in which the prescribed distance between the beds is afforded, we would refer to the noble wards of St. Bartholomew's, the London Hospital, Guy's, the London Fever Hospital, and the fever wards of the Sussex County Hospital. In these the construction is somewhat irregular. The Surgical Hospital at Glasgow and the new hospital at Chatham are examples of wards in which the beds and windows alternate.

† When cubic space is obtained, as at the Salisbury Infirmary, by great height of the wards, the beds having an insufficient surface area, may be too close together, and thus be overcrowded. The beds may also be crowded from an inconvenient shape of the ward, as at Lincoln and Gloucester, which compels the placing of all the beds along one of the walls.

Curtains.

The common sash has this recommendation, that its opening can be accurately adjusted to the requirements of any patient who may be lying near; while the sash windows in which the compartments fall inwards instead of moving up and down has the advantage that the draught can never come down directly on the patient's bed. In the form of this window in such general use (Middlesex, Guy's, and St. George's in London, and numerous hospitals in the country,) all the partitions are connected to and moved by a single rod, so that all must open at once, but it is easy to make one partition to open without the others.*

The chief obstacles to the free ventilation of wards which are found in those we have seen, are the curtains round patients' beds, and the partitions by which wards, which would otherwise be open to the air on each side, are split down the centre. The consideration of the latter subject will naturally connect itself with that of the shape of the wards. As to curtains, we cannot help saying that in well-constructed and well-ventilated wards they are useless for purposes of health, except perhaps in some special cases. In some of our oldest foundations, as St. Bartholomew's, Guy's, St. Thomas's, the practice of enclosing the head of the bed with curtains has obtained for ages, and in some of the country hospitals,† the same remnant of old fashions prevails. Where the natural ventilation of the wards is good, where the curtains are not drawn during most part of the day, and particularly where they do not surround the whole of the bed, no great harm appears to ensue, but where, as in the Parisian hospitals, all these conditions are reversed, we can hardly resist the conviction that they add to the unhealthiness of the wards and to the risks of erysipelas, a disease which is known to be so much fostered by bad ventilation, and so often to cling to beds where there is any source of local impurity.‡ It is very possible, however, that in special cases or in special hospitals (chiefly in those destined for affections of the chest) curtains at least round the upper part of the bed would be almost necessary, so that some beds capable of this addition, when required, ought to be provided.§ A rather singular use of curtains may be seen in the wards of the Royal Free Hospital; in these wards, which are long and narrow, somewhat like a tunnel in shape, it has been found advisable to subdivide the ward at night into four separate parts by large curtains stretched across from side to side. This arrangement does not seem to have had any directly bad influence, as far as has been observed, although it can hardly be denied that such permanent curtains must prove a permanent receptacle of dust and dirt, and that on that account alone the contrivance is objectionable.

* In some hospitals (*e.g.* Manchester, Hull, Nottingham, Whitworth at Dublin, and many others) a perforated zinc plate is substituted for one or more of the window panes with advantage. It ensures some supply of fresh air, without draught. In others a piece of perforated zinc is let into the window frame itself. At Maidstone there is an arrangement by which a current of air is admitted obliquely upwards, while the window is closed. This is effected by making the lower part of the window frame half a foot in depth on the inside, so that the lower sash can be put up to that extent without opening the window, and thereby allow of a valvular opening between it and the upper sash. At some hospitals, as Whitehaven, the upper section revolves on a horizontal axis, while the lower is an ordinary sash.

† As at Norwich, Canterbury, &c.

‡ See ERYSIPELAS, by Mr. Campbell de Morgan, in Holmes's System of Surgery, vol. i., p. 243.

§ We would rather not follow our good friend M. Blondel (see Blondel et Ser, Rapport sur les Hôpitaux civils de la Ville de Londres) into the discussion whether curtains round the beds are necessary to the privacy and decency of the patients. No such necessity appears to be felt in our English hospitals, nor, let us add, in the numerous hospitals at Paris, where the curtains are not used.

The shape of the wards must determine whether it is possible to arrange the beds in two rows only, or indiscriminately round the whole wall, or in several rows, three or four, as the case may be, and in the latter case it must be further considered whether the wards ought to be split down the centre by a partition, or the rows of beds left standing apart in the centre of the ward.

In this, as in every other part of this report, it is our wish, as far as our materials allow, not to express our own opinion so much as to relate what results we have found to follow upon various plans. We confess, then, that looking to the results obtained, we are inclined to regard the shape of the wards as a matter of minor importance, provided all parts are well ventilated, and provided that there are no corners and recesses to serve as refuges for dirt and impurities, and the position of the beds as a matter also of minor importance, provided none are too close to each other. To say that this or that shape of ward is the only one that ought to be adopted, is to make an assertion for which there is only little foundation in theory, and still less support in experience. A ward of great length is theoretically less advantageous than one of more moderate dimensions*; but of how small importance such considerations are found in practice may be shown by comparing the vast wards in some of the old hospitals at Paris (as St. Louis, La Charité) with the wards of modern construction at Beaujon and Lariboisière. Any advantage which the more appropriate form of the latter might secure over the former is masked by the pervalent system of bad ventilation, &c., which condemns both to a common unhealthiness, and as far as can be ascertained the newer hospitals are not more healthy than the older ones.† Again, the division of one ward into two compartments by a wall running down its centre, and perforated by openings establishing a communication between the two ("spinal wall"), as at St. Bartholomew's, the London Hospital, Guy's (new wards), the Fever Hospital, and King's College, in London, or at Exeter, York, Perth, and other hospitals in the country, is evidently an arrangement dictated by the convenience of the architect, and which is less perfect in theory than one which leaves all the wards independent of each other. Yet the comparative triviality of such considerations is shown by the successful practice which some at any rate of those hospitals have attained, as compared with that of others, where, although a more perfect theoretical shape of the ward has been secured, considerations of far more practical moment have been neglected or mistaken. In the hospitals mentioned above, as far as we have been able to discover, the success of the practice has not been affected in any discoverable degree by the fact of the two parts of the ward being in communication, although if one part of the ward were specially used for the reception of fever or small-pox, it would seem desirable to isolate it from the other.‡ In other respects it is difficult to understand

Double wards.

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* The unhealthiness of the large corridor wards at Scutari has been instanced, but there were causes of unhealthiness in that hospital in comparison of which the shape of the wards is a matter of absolute insignificance.

† At the temporary St. Thomas's Hospital two large wards have been in use for a year and a half, each containing 84 patients in six rows of beds, without any partitions, except one of only seven feet high, running only down a part of the ward. Both have been hitherto perfectly healthy. At St. Mary's Hospital, also, the accident ward (which is the best ward in the house) has four rows of beds without any separation, except a similar partial partition.

‡ Thus, in the Manchester Infirmary a patient in one ward contracted small-pox from one in the next, there being a ventilating opening between the wards.

what disadvantage one compartment can sustain by sharing the atmosphere of the other, provided both are equally pure. We should conclude, therefore, from what we have had the opportunity of observing, that on abstract and theoretical grounds it is desirable to build the wards of such a shape as to have windows on each side and a row of beds intercalated with the windows; but that if considerations of space and architectural convenience strongly dictate such a construction, there is little danger in making double wards, such as have been in use at St. Bartholomew's, with the best results for so many years, or quadruple wards like those of the London Hospital. At the same time we believe it to be advantageous to provide very ample ventilation at the ends of each compartment, such as is afforded at St. Bartholomew's by the large airy staircase.*

The size of the wards is a subject so directly connected with nursing, that it must be considered in connexion with that subject. A reference to the table printed on page 488 will show that in hospitals divided into a large number of wards, containing a few beds each, there can be no efficient supervision of the patients, since the number of the nurses is usually below that of the wards.†

Artificial ventilation.

We now come to the question of subsidiary ventilation,—this subsidiary ventilation being either natural, by means of chimneys, air-shafts, and openings of divers construction communicating with the open air, or artificial, and worked by means of machinery. As this report is directly concerned with British hospitals only, we feel it unnecessary to dwell on the advantages of the open fire over the poële or calorifère of the French hospitals, or over the injection of warmed air, as a means of heating. Nor can it be doubted by any one who will hold his handkerchief to the fire, how powerful a means of renewing the air of the ward the one or two large open fires which are found in almost every hospital ward with us, must be. It is therefore, we believe, with some reason that English writers have attributed the ill-ventilated condition of Parisian hospitals in great part to the absence of fire-places. But what, if any, accessories are required to the windows (including openings into the staircases and corridors), the doors, and the fire-places? We believe that provided the cubic space is ample, the beds well apart from each other, and the windows constantly open, no accessories whatever are necessary.‡ At the

Accessory ventilation.

* In some hospitals (e.g. Charing Cross, and to a certain extent St. Mary's Hospital,) the wards open out of each other, so that, though apparently separate chambers, they are really in communication. This is undoubtedly a plan of hospital construction which would not be adopted unless in case of urgent necessity, and more particularly if the hospital be intended to receive cases of fever, especially the exanthemata.

† The Manchester Royal Infirmary has received its fair share of vituperation, but to our minds its chief defect is the enormous number of small wards or rather chambers into which it is divided. Again, at Huddersfield, a hospital very well situated, and otherwise well constructed, appears to have been made to some extent unhealthy by being cut up into small wards, in which the beds are necessarily crowded together, although they have a sufficient allowance by measurement of cubic space. Yet small wards, however undesirable for a hospital intended for the treatment of acute disease, may be very suitable for one like Netley, in which invalids and convalescents form the great bulk of the patients. At the Brompton Consumption Hospital the small wards and heating of the air seemed to us well adapted for the class of cases. But, nothing can well be imagined more unreasonable than the plan pursued at Derby, where the natural ventilation of the house has been spoiled by cutting it up into small rooms and closets, and then machinery has been provided to ventilate it.

‡ At St. Bartholomew's Hospital all the accidents and emergencies of the most crowded part of a large city (except small-pox) are received freely, without any check or limit; and all infectious cases are treated in the general wards. No artificial aids

same time many hospitals use, and it is thought with some advantage, some of the numerous contrivances for bringing the external air directly into the wards, which must be familiar to most readers.* In such contrivances for what may be called accessory natural ventilation, the power which is to impel the air into the ward is the difference in density between the warmed air in the ward and the outer air. Whether such appliances are necessary or not in the buildings to which they have been adapted, we shall give no opinion; but they are not costly nor troublesome, and they are thought, in many of the hospitals where they have been long in use, to contribute to the wholesomeness and sweetness of the wards.

Artificial ventilation.

It is quite otherwise with the machinery which has been erected for artificial ventilation. We have no hesitation whatever in expressing our opinion, founded in all cases on observation and such an examination of recorded facts as we have been able to make, that every pound (and they have unfortunately been many thousands) which has been expended on these costly and elaborate machines has been wasted. The example of Guy's Hospital is familiar to all medical men in London, and the superiority of the old wards with natural ventilation to the new ones connected with the artificial system, is an admitted fact. The utter failure of the very ingenious machinery in use at Lariboisière and other hospitals in Paris to keep the wards in a healthy or even a sweet condition, proves the inefficiency of such contrivances. These systems (at least those on the principle "par injection") do no doubt keep up a constant supply of air to the wards, yet they do not ventilate them. No amount of cubic feet of space, no plan of building, no artificial system, no combination of all these adjuncts to a good ventilation, has ever been found to replace open doors, windows, and fire-places, while provided with the latter, which are the essentials of good ventilation, many old crowded defective hospitals† have maintained for a long series of years an amount of success which the most eminent examples of scientific construction have never found practicable.‡ Considering, then, the utter failure of artificial systems and the perfect success of the natural system of ventilation, is it going too far to say that to expend money in the construction and in the maintenance and working of such machinery would, after our present experience, be wantonly to waste and misapply the funds contributed for the benefit of the poor?§ The experiment was a natural and a most justifiable one, but it has had a fair trial and failed; any further repetition would be culpable.

We do not intend to assert that artificial ventilation or artificial

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to ventilation are thought necessary. The wards, being constructed on the "spinal-wall" system, cannot have the advantage of opposite windows. But the cubic space is ample, 1350—1800 feet, and the beds far apart, none being nearer than four feet, and the majority eight or nine feet, from each other. The hospital yields to none in London, nor we believe elsewhere, in salubrity.

* Such as Barnstaple, Worcester, York, &c. An easy and, as it seems to us, a tolerably efficient accessory to ventilation, may be seen in use at the London Hospital, the new hospital at Guildford, and the hospital at Reading. It consists of a chamber by the fire-place communicating with the outer air by a pipe, and with the ward by a grating. The heated air passes, by its own elasticity, into the ward; the current of fresh air passing into the ward is very sensible to the hand held over the grating.

† *e. g.*, Leeds, Edinburgh, Norwich.

‡ Among the examples of the utter failure of artificial systems, we may enumerate York, Liverpool Royal Infirmary, Bristol General Hospital, Derby, Edinburgh, Maidstone, Brighton, and the Manchester Royal Infirmary.

§ The expenses of construction and of working of these machines in the Hôpital Lariboisière may be stated in round numbers at £20,000 for construction, and £1,880 a year for working in order to ventilate a hospital of about 600 beds. A little ought to be deducted from the working expenses in consideration of the fact that the same engine supplies hot water to the laundries, &c.

heating do any harm if applied to wards which are kept healthy by the use of the natural means of ventilation.* Artificial heat may even be found advantageous, if not necessary, in special hospitals for diseases of respiration.† But we have a strong conviction that where such machinery is used as a substitute for natural ventilation and open fire-places, it will produce the most deadly results, and this conviction is founded on what we have learnt both at the Parisian hospitals, where such systems are still in use, and at the British hospitals, where (when used as they are at Paris) they have all failed to stand the test of practice, and have been given up.

We have been led to say so much on the necessity of a due supply of fresh air to the whole building, and to each ward in it, and on the best means of securing such a supply, because it is, in our view, the essential feature in hospital construction, with which almost every shape of hospital and of ward has been found to fulfil its purpose, and without which none of the many that we have visited, admirable as many are in some other respects, have been found to be safe receptacles for the sick and wounded; but we must now turn to the subordinate, though only little less important, objects of providing for the removal from the ward of the impurities which may be generated by the natural secretions of the patients, or by large discharging or sloughing surfaces, or the exhalations of acute diseases, such as fever, small-pox, or erysipelas.

Waterclosets and drainage.

That all secretions should be as soon as possible removed out of the ward appears necessary to the perfect sweetness of the atmosphere, and the experience of the Aberdeen Infirmary appears to bear testimony to the good results obtained by a very careful removal of all vessels, dressings, &c., which can in any way become sources of impurity.‡ The construction and position of waterclosets is also a very important part of the arrangements of a ward. In old times it appears to have been a common custom merely to cut the watercloset out of one corner of the ward, separating it by a boarding from the chamber itself; and instances of this very faulty and dangerous arrangement may still be seen in some of our country hospitals.§ It clearly ought to be banished from all well-constructed buildings. In other respects these arrangements, though not faultless, appear good in most of our British hospitals. We shall not dwell upon the contrast offered by those of Paris, since the authorities there are conscious of the defect, and are endeavouring to remedy it to the best of their power. Unfortunately, not to speak of other obstacles to success, the deficient drainage of Paris opposes a very serious difficulty in the way of the construction of proper waterclosets.‖

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* As at Exeter, at the Liverpool Southern Hospital, at the London Fever Hospital, the Small-pox Hospital, the Consumption Hospital, the Worcester Infirmary, and some others. At some of these the air is previously warmed.

† We have spoken of artificial warming as usually unnecessary for the wards, if not injurious; but for corridors and staircases it is often very advantageous. Systems of artificial heating for these subordinate parts of the hospital are in use at the Westminster Hospital, at Wolverhampton, and many others.

‡ At the new hospital at Bury St. Edmunds nothing whatever is kept in the ward, neither clothes, medicines, nor food. This certainly keeps the ward very neat, and avoids the risk of the closets getting choked up by the various articles which patients in the country are so much in the habit of throwing down them; but it may be doubted whether it would be feasible in London hospitals or others, where cases of very variable severity are under treatment, and where, therefore, medicines and stimulants have to be served out at very irregular intervals.

§ *e. g.*, Cambridge, Dumfries, Nottingham, Southampton, Canterbury, Winchester, (female venereal wards), Plymouth (some wards), and the new surgical hospital at Edinburgh.

‖ At some hospitals in Ireland (*e. g.* the Hardwicke Fever Hospital and Mercer's Hospital at Dublin) there are no waterclosets.

For we must not forget that the secretions and other offensive matters can only be properly removed from the wards and from the hospital when there is a ready and immediate access to a proper system of drains. Not to multiply instances of what is so very familiar to every one, as that even a private house cannot be kept in a state of health without the constant and entire removal of all offensive and putrefying matters, much more a large hospital crowded with sick, we will merely refer in the margin to hospitals which furnish instances of the generation of hospital diseases by inefficient drainage, and their remedy by the correction of this defect.*

The conditions of safety for wards containing numerous acute cases have been spoken of in the chapter on "Regulations," under the heads *Fever Wards* and *Separation of Diseases.*

Floors.

Erysipelas has often appeared to be generated in hospitals by a damp condition of the floors, and may always be, if not excited, yet certainly favoured by any reservoir of dirt. On both these accounts it is most desirable that the floor should be smooth,† so as to dry easily, and white or light coloured, so that dirt may be instantly detected. An idea has become prevalent that dry rubbing of the floors is necessary in order to avoid erysipelas, and that it is an efficient precaution against it; but this idea does not stand the test of inquiry. The plan of waxing and polishing the floors‡ appears to us a very good one; the wards look extremely nice, and in some of the hospitals where this plan has been substituted for that of scrubbing, the servants who have had to carry out both say that the dry rubbing plan is the easier§; but as to its being effectual in the prevention of erysipelas, the evidence seems the other way. Thus, erysipelas prevails extensively in the hospitals at Paris, where this plan is usually adopted. In Birmingham there are two hospitals, at one of which (the General Hospital) the floors are dry rubbed, while at the other (the Queen's Hospital) they are scrubbed; yet the former is certainly not more free from erysipelas than the latter. On the other hand, the use of scrubbed

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* The hospitals at Winchester, Lincoln, Plymouth, and Shrewsbury illustrate the former point, and those at Hereford and Chichester the latter.

When there is not an outfall for the drainage, as is the case in so many towns, cesspools must be used. In such a case we have seen no better plan for curing such of the evils connected with them as are curable than the one used at Winchester, where a large cesspool has been constructed near the hospital, into which all the drains converge, and to this an overflow-pipe has been connected, and the surface of the cesspool has been covered with a vulcanised zinc grating, over which a layer of vegetable charcoal, 13 inches in thickness, is placed. Every drain pipe also, as it leaves the house, is replaced to a small extent, in its upper part, by a 3-inch zinc grating, with several inches of charcoal above it. The result has been excellent. The waterclosets which used to be offensive have ever since been quite free from odour, nor is the least smell to be detected, even in the immediate neighbourhood of the large cesspool.

† The evils of old rotten floors are illustrated by the experience of Winchester Infirmary, where they are believed to have contributed to the prevalence of erysipelas.

‡ The plan of polishing and dry-rubbing the floors is followed at the following rural hospitals: Bury St. Edmunds, Chester (in some wards), Hull (some wards), Reading (new wards), Stafford, (new wards), Worcester, and perhaps a few others, and in the following provincial hospitals: Birmingham General Hospital, Newcastle (for some wards), Manchester, Wolverhampton; but in no metropolitan hospital. The latter fact is significant. In fact, the plan seems unobjectionable, but also comparatively unimportant. At a few of the above-mentioned hospitals, however, the floors are washed, but they are polished, and are dried immediately after cleansing. The object is to avoid damp, and to afford no absorbent surface for discharges and secretions.

§ We do not think it necessary to give the details of the several methods of preparing the floors and keeping them in order.

CONSTRUCTION OF HOSPITALS.

floors is almost universal, and is therefore found in numerous hospitals where erysipelas is hardly known. We conclude, therefore, that, although damp and ill-kept floors may tend to the production of erysipelas, no such effect is found to follow from the scrubbing of smooth floors, free from crannies; and that, if the floor be well made, it is indifferent whether it be dry rubbed or scrubbed. But in the latter case the wet ought not to be allowed to lie about longer than necessary.

There are but few British hospitals where other materials than wood are used for the floor. At Lincoln, however, and in the new hospital (General Hospital) at Bristol, the floors are made of plaster; and in many of the Paris hospitals the old tiled floors are still in use. This is the case also in some of the wards at Edinburgh and at Dr. Steevens's Hospital.* Such materials are, however, cold and comfortless; they seem to require about the same labour in sweeping or scrubbing that boarded floors do; the plaster is liable to crack, and then becomes very objectionable, as the cracks allow the soakage of matters which ought to be removed; and if it be true that well-kept boarded floors are easily and safely kept in order under either system, no other material need be sought.

Walls.

It appears a matter of some importance in the prevention of hospital diseases that the walls of the ward should be of such a nature as not to absorb any of the matters which may be suspended in the hospital atmosphere. Of the evils which follow the neglect of this precaution we have a few proofs in facts, which, though not very convincing, render it advisable, at any rate, to adopt measures to render the walls non-absorbent,—measures which must be harmless, even if they should be thought superfluous. The evils which result from the walls of the ward being of a very absorbent material have been most clearly noticed at the hospital ship "Dreadnought," where the walls are of white-washed wood. There† the old ship "Dreadnought" had become greatly infected with hospital diseases, chiefly erysipelas and pyæmia, and surgical operations succeeded very badly; but, on the substitution of a new ship (the "Caledonia"), these affections almost disappeared for some years. Now, again, after the latter ship has been in use for seven years, the same affections have re-appeared, and threaten to attain the same height, although the new ship is much more roomy than the old; and the other conditions (as to river atmosphere, miasmata, &c.) appear to be unchanged, or changed for the better. Again, the same thing seems to be shown by a fact which was related to us by a gentleman who was one of the surgeons to the Hôpital St. Louis at Paris at the time of the event related. The walls of the obstetric wards had got extremely dirty, but were allowed to remain so, in consequence of the very healthy condition of the hospital, for a considerable time; the authorities of the hospital being unwilling to make any change, so well was everything going on. At last, however, the dirt and dilapidation became too conspicuous to be any longer endured; but, immediately on the walls being scraped, the hospital was visited by a severe attack of hospital disease.‡ Facts like these seem to show the importance of

* We may notice, as a good application of tiles in a boarded floor, the new accident ward at Oxford, where each bed is surrounded with tiles, so that any dirt or secretion can be at once seen and removed.

† See a paper by Mr. J. Tudor, in the Lancet, 1859, vol. i. p. 361.

‡ At some hospitals, as the Royal Free Hospital, the Convalescent Hospital at Southport, &c., the walls are merely the bare bricks stained; an arrangement which certainly looks cheerless, but may possibly, in a sanitary point of view, have its advantages.

having some material for the walls which, like Parian cement* or glazed tile, is impervious, and can be kept absolutely free from all impurity with very little trouble. One advantage, however, of walls and ceilings which require whitewashing is, that the process affords an opportunity for the yearly evacuation of each ward, a precaution which can hardly fail to be salubrious.† As to the ceilings, the same observations will apply to them as to the walls, but in a less degree. If the expense of the polished ceilings "en stuc" of the new Parisian hospitals be not thought an objection, it is possible that it may be remunerative, not only in decoration, but in healthfulness also.

As to the subordinate parts of a hospital, it is perhaps, unnecessary to say much. The convalescent or day rooms which are found in many small, and in some large hospitals, have appeared to us to be useful in taking some patients permanently (at least, during the day) out of the ward, thus withdrawing them from any morbid influence which may reside in the atmosphere of the ward, and allowing to the other patients who cannot leave the ward more air and space.‡ In some hospitals (*e. g.* Bristol General Hospital) the plan is much liked, but unless care be taken in their construction and location they may be found utterly useless, as at Lariboisière.

Day rooms.

With respect to sculleries, bath-rooms, and such things, all we need say is, that the more clean and airy they are the better, and it may be added that the less numerous they are, consistent with the proper service of the house, the more easy the task of supervision will be.

Sculleries, &c.

For these, as well as for every other reason, a number of little wards, each of which requires its own dependencies, and furnishes its own quota of dirt and impurity, are to be avoided.

With respect to bedding, many very different materials are in use. On this subject we have not thought it necessary to enter. But we may be permitted to enforce the importance of scrupulous attention to the frequent cleansing of the bedding by pointing to the examples of the hospitals at Reading and Oxford, where a neglect of such cleanliness was followed by severe outbreaks of erysipelas.

We now come to the third purpose for which a hospital is erected, viz., as a place where a number of sick persons can be nursed and cared for in less space and by fewer nurses than if they were scattered about in separate chambers.

Wards.

We have found in a great majority of the hospitals of ancient construction, and many of more modern date, that the hospital is cut up into a large number of chambers or small wards, of from six to eight beds each. This construction is, we think, almost fatal to efficient ventilation. These small rooms can never be kept free from draughts, except by excluding all free ventilation. The consequences in a country hospital appropriated chiefly to chronic cases may not be so disadvantageous, but in those for the constant treatment of acute diseases we think there is no doubt that roomier and more airy wards ought always to be chosen.

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* Parian cement is used for the walls at Newcastle, King's College, and many hospitals recently constructed, as Guildford, Oxford (new ward). Stucco is used for the walls at the Mater Misericordiæ Hospital, Dublin.

† Thus, at Whitehaven, in the fever-house, the walls are stuccoed. Whether in consequence of this material not requiring whitewash or no, we cannot say, but the fact was noted that at the time of our visit the fever ward had not been thoroughly emptied and cleansed for five years.

‡ At St. George's Hospital there is a day room for men and one for women. On an average of seven days the number in these two rooms was 50 daily.

Size of wards.

All large hospitals should, it is true, contain some separate chambers for delirious patients, for surgical operations of peculiar gravity, and other special cases. But apart from these, it is, we think, an almost universal opinion that for large city hospitals large wards are better than small. Their superiority in ventilation we have already dwelt on, and as to nursing, we need do no more than refer to Miss Nightingale's work on hospitals, whose eminent authority on this point will not be questioned by any one. In fixing a mean number of about 20 to 32 beds for each ward, Miss Nightingale has been guided chiefly by considerations of the facility of nursing, and there can be little doubt that she is right, since the same size of ward will be found in general use in most of the large London hospitals. It is difficult to perceive any advantage in having larger wards than one chief nurse can superintend; and though some of the objections to very large wards may seem theoretical merely, not to say fanciful, still we may allow that these large wards are in some respects, not only to the eye and imagination, but also in fact, separate units; and that one part may share in the misfortunes of another. No good seems to be obtained from having patients in such large wards as some of those at St. Louis and La Charité at Paris, while it is not to be denied that some risk is run. This risk, however, we believe to be very slight, and cannot adduce any acts which distinctly prove such very large wards to be less healthy than those of more moderate size.

Small wards.

But if facts are wanting to prove what is the amount of risk, if any, in building a ward of very large size, always supposing that there is free ventilation in all parts of the ward, and that all other arrangements are good, we believe that it is easy to show what numerous objections there are to very small wards. We have, however, already indicated the chief objections, which are, that these small wards can hardly be so placed as to have thorough ventilation, and are consequently always more or less close, that they cannot have effectual supervision from a moderate staff of nurses, and that if the hospital be constructed to contain acute cases, each ward must have its own water-closet and scullery in its immediate neighbourhood. On the whole it will be found that such wards cannot form the chief part of any hospital, without pre-supposing a plan for the entire building inconsistent with thorough ventilation. If the hospital be built on the block, or the H plan, or with the wards on one side of a corridor, it will be found difficult to contrive so as to cut up the whole building into little rooms, with four, six, or eight beds each. In fact, most of the hospitals at which this plan is followed, are of a confused plan and usually of antiquated construction. Yet the system must have its advantages, or it would not be so very generally prevalent in our rural hospitals. The fact seems to be, that in such hospitals where the number of beds vacant is (in consequence, as we have before shown, of their system of admission), always considerable, and sometimes equal to a third or even a half of the total number of beds, it is often difficult to find applicants who would fill the large wards, and that under such circumstances the wards look cheerless and become cold.* Another reason may be, that small wards are always more stuffy than large ones, and that country people have usually a great horror of fresh air. We have been assured by the residents at numerous hospitals, that it is not without continual attention that

* Thus it has been found necessary to divide one of the large fever wards at Dundee into two. There were so few patients that the ward became cheerless and cold, especially in winter. What occurred there, in consequence of the limited number of cases of fever, would be more likely to occur from the limited number of general cases often applying at some county infirmaries.

they are enabled to counteract the constant attempts of both patients and nurses to close the windows; and at hospitals, such as Exeter, where there are older wards which are close, and newer wards more perfectly ventilated, the patients who have been before in the house generally try to get placed in the former. These prejudices, which are now chiefly confined to the lower classes, for the habits of persons of better station lead them to prefer large and airy apartments, appear to represent what was the universal fashion some time since. We have numerous examples in the case of hospitals built more than a century ago,* that the sweeping assertion that there are no good hospitals except of modern construction, is untrue. Still we must allow that a due regard to ventilation, space, and light was less common then than it is now.

On the whole, we regard small-sized wards as far less adapted for hospital purposes than those of larger size, and wherever such wards are used for the treatment of acute diseases,† we believe the hospital will always be found to be unhealthy.

Shape of wards.

The shape of the wards must be in a great measure regulated by their size. Very broad wards can hardly be conveniently placed in buildings of the usual shape. Many objections have been made to wards divided down the middle, as at St. Bartholomew's, the London, King's College, and Exeter Hospitals. But as we have before proved, these objections are not supported by the results of practice in those hospitals; and we can hardly repeat too often that the theoretical objections that have been made against certain arrangements of hospitals, however high may be the authority on which they rest, are worth little, unless supported by facts bearing directly on the question at issue.

Whatever the shape of the ward, it ought to be clean and well ventilated in every part, and this can hardly be the case if there be corners and recesses. In some hospitals a vicious striving after architectural effect has led to a neglect of this rule,‡ and there is a consequent difficulty in keeping the wards sweet.

Side wards.

Connected with the size and shape of wards is the question of the propriety or expedience of having side wards, that is to say, of cutting off a portion of the main ward from the rest, in order to place one or two special patients in it. It is a plan very extensively followed, and we must confess to so much respect for the wisdom of our predecessors and colleagues, as to own that the extensive prevalence of any plan in hospital construction is in itself a presumption in its favour. We will name in the margin a few of the British hospitals in which this plan is adopted.§ In Paris it is almost universal. On the other hand, in some of our largest and best hospitals, no such arrangement is found.‖ But it must be allowed that separation wards, if not absolutely a necessity, are at least extremely useful, and the advantages of having them close to the main wards are very great. The patient need not be taken from under the care of a nurse, to whom he has perhaps got attached; he is easily moved back again if the necessity for his separation has passed away, and the convenience of supervision and nursing is much greater. At University College Hospital we were informed that much good appeared to have resulted from this arrangement,

* *e.g.* Guy's, St. Bartholomew's, Haslar, the Rotundo, Dublin.

† As at Manchester, Birmingham Royal Infirmary, Bradford (old hospital).

‡ As at the Liverpool Northern Hospital.

§ University College, Glasgow Infirmary, Queen's Hospital, Birmingham, York Hospital.

‖ Thus, in St. George's Hospital there are only one or two separate chambers, and those in remote parts of the building. The same is the case at St. Bartholomew's. At King's College Hospital there are absolutely no separation wards.

mainly in the facilities which it affords for the separation of cases of erysipelas and others which might possibly infect the wards, and in the treatment of cases of disease of the respiratory organs, which might perhaps not be able to bear the amount and the constancy of ventilation which is found wholesome for the general ward.

But these remarks apply to small chambers for one, or at the most two, separate beds. We can discover no utility in the plan, which is met with in some Parisian hospitals,* of dividing the main ward into two parts, one of which is about a fourth the size of the other.

An idea appears to prevail, that there is some danger in placing patients in rooms above each other, or, in other words, that the upper floors are less healthy than the lower. For this reason it has been taught that no hospital ought to be built in more than two stories. If this fact were so, it would be perhaps the most important of all those bearing on hospital construction, since it would at once prescribe a reduction in the height and a corresponding increase in the area of two thirds of the hospitals in the kingdom. But we have sought in vain to verify it, either by personal observation of the many hospitals in which more than two stories are used as wards, or by the opinions of the hospital authorities, who appear indeed to be almost unanimous in the contrary opinion. Thus, at St. Bartholomew's Hospital four floors are used as wards, and we are assured that no difference is perceptible between the healthiness of the different stories. At St. George's Hospital all the cases of grave operation are placed in the immediate neighbourhood of the operating theatre on the second floor, and appear not to suffer any infection from the medical wards on the first floor. At Glasgow five floors are used as wards, so that here, if anywhere, a very great difference ought to force itself on the observation of the medical staff between the recovery of patients on the ground floor and on the fourth. But no such difference, in fact no difference at all, appears to exist. Instances to the contrary, that is to say, where the general impression of the medical staff is, that the upper is the most healthy floor of the house, are not wanting†; but we have not found any distinct evidence on the subject, and believe that one floor is just as healthy as another, provided the wards are of the same or similar construction. That in well-constructed hospitals any one ward, still less any one story, shares in the atmosphere of another, is neither proved nor probable. In fact, the distances are too great, and the currents of air too complex, in large hospitals, for us to believe it possible that any inter-communication can exist between wards separated by corridors and staircases, unless‡ they are artificially placed in communication. Again, if it be true that wards at a distance from each other share in each other's atmosphere to so great an extent, how can it also be true that beds so close together, as six or seven feet from each other, in a large well-ventilated ward, are so independent of each other's atmosphere that typhus fever can be put in one without any risk to the patient in the next? It is no answer to this to say that in the one case the current rises vertically, while in the other it would have to travel horizontally; for a moment's thought will show that in order to reach any other ward, whether on the same floor or the one above, the supposed morbid emanation would have to travel a far greater distance horizontally than in order to affect contiguous beds, or remote beds in the same ward. It may be, and most

* *e.g.* Hôpital Necker, Cochin.

† *e.g.* Oxford.

‡ As is the case at the Derbyshire Infirmary, where some of the lower wards have a staircase, with a trap-door, directly into those above them.

probably is, true that if the whole atmosphere of the hospital be vitiated by defective ventilation, and close aggregation of sick, the upper floors may be more unhealthy than the lower. On this head we have no positive evidence to offer; but we say most unhesitatingly that in the numerous moderately healthy hospitals which we have visited, and in which upper floors are used as wards, they are to the full as healthy as the lower floors; that we believe that even if a current of air could be proved to set from one ward or floor into the wards on a higher floor, the distance and the interchange between the hospital atmosphere and the fresh air, which must have occurred in the transit, would be sufficient to render the communication harmless; but that no such thing has ever been proved to exist. We regard, therefore, the construction of wards on third or fourth stories as a question purely of convenience. No floors above the second can be conveniently used without a lift for conveying patients, nor is it quite convenient to use the second floor without such machinery, but these lifts are now in such general use that probably there will soon be few large hospitals without one.

Lift.

If all the subordinate parts of the hospital have been well constructed for ventilation and space, and all are kept in perfect order by drainage and cleanliness,—cleanliness, that is of the patients and their bedding, as well as of all parts of the building,—we have no hesitation in saying that the size of the hospital is a matter of absolute indifference; whether it contains a hundred patients or a thousand does not appear to exercise the least influence on the health of any individual in the hospital.* The experience of unhealthy hospitals where erysipelatous or feverish affections are propagated and fostered by bad air, dirt, and crowding of the sick, has no application to those of a different kind. A hospital of 50 or 60 beds, receiving the mildest cases†, can be made uninhabitable for hospital purposes in a few years by neglect of the laws of natural ventilation or natural cleanliness. A hospital containing many hundred beds under one roof can be maintained in efficiency for a century, though it receives cases of the most formidable kind, if those laws are properly carried out.‡ We cannot imagine on what data the proposition is founded, which is supposed to be at the base of the pavilion plan of building hospitals, and which asserts that it is dangerous to place more than 100 patients under the same roof. Certainly nothing that we have seen in

Size of hospital.

* From the low mortality presented by some small country hospitals, as contrasted with the high mortality of large hospitals (which be it remembered are all situated in great cities), some writers have been led to infer that the difference depended on the size of the hospital, and have rashly ascribed it to concentration of hospital atmosphere. The mere fact that under similar circumstances small and large hospitals show no appreciable difference in mortality is fatal to this hypothesis. Thus the mortality of the small and large Paris and London hospitals does not vary, or if it does, the small hospitals have the larger mortality, probably because they are more pressed for room. The smallest country hospitals, such as those at Dover or at Hemel-Hempstead, have it is true a low mortality; but the reason is obvious to any one who will go over them, and see what kind of cases they admit. At the Dover Hospital, nothing but purely chronic cases are taken in except a very few accidents, and the death-rate is of course very low. At the Infirmary at Hemel Hempstead, the institution has acquired a considerable surgical reputation from the connexion with it of Sir A. Cooper and Mr. Aston Key; so that the surgical practice is more active, and therefore the death-rate higher. But even at so small a hospital as that at Lancaster, where the average number of patients is only 12, if (as is the case there) all classes of cases are taken in, the death-rate rises up to the level of that of a metropolitan hospital. At Lancaster it was 9·2 per cent. in 1862.

† This was the case at the York County Hospital, and at the Radcliffe Infirmary, Oxford.

‡ We would refer to Guy's Hospital, the London Hospital, the Naval Hospital at Haslar.

the British hospitals gives the least countenance to the idea that in well-constructed establishments any danger is incurred by exceeding that number; and nothing that is to be seen at Paris lends countenance to the hope that any safety is obtained by keeping within it. We have expressed our conviction that pyæmia is often excited by the crowding together of acutely suppurating sores in the same ward; but this is an altogether different question. Allowing that each ward is healthy, and that, say 30 patients, may be safely placed in the same ward, we see no reason to doubt that it is just as safe to put 100 wards together, and accommodate 3,000 patients in the same hospital.*

On the whole question, then, raised by consideration of the sources of danger proceeding from the necessary aggregation of the sick in hospitals, and the means of avoiding such danger, we would reply that, as far as our study of existing hospitals has enabled us to judge, we believe that the danger proceeds from too close proximity of the sick to each other exclusively, and that if the beds be placed far enough apart, and the ward be properly ventilated, all diseases which occur in this climate, except small-pox, may be treated in the ordinary wards, provided the cases of fever be not too numerous:† What "far enough" means for the beds, and "too numerous" for the cases of fever, we are obliged to leave somewhat doubtful, inasmuch as direct experiment on the point is wanting and would perhaps be unjustifiable. But we cannot discover any instance of propagation of fevers to patients in hospitals where the beds are 6 feet apart,‡ and the cases of fever are admitted in the proportion in which the disease generally occurs, and mixed indiscriminately with the other patients. If separate fever wards are instituted, or if the disease occurs in such numbers as to convert the ordinary wards into fever wards, it would be right to give each bed half as much space more, and with these precautions we believe the patients would be secure from infection by each other.

Questions connected with medical school.

In the preceding section on the Regulations of hospitals, we have endeavoured to show how great an influence the presence and the activity of a medical school has upon the class of cases taken into any given hospital, and thereby on its sanitary condition: we have also adverted to the consideration (so very important for establishments like our country hospitals as they are at present constituted) of the propriety of separating medical and surgical cases for the convenience of tuition. But a few other considerations suggest themselves as bearing on the construction of a hospital destined to accommodate the students of a large medical school. The details of medical education are now the subjects of active discussion, and it is possible that the present system of clinical teaching may soon suffer some alteration; but, so long as instruction is supposed to be afforded to students, and diagnosis and treatment not hindered, by the medical officer making his visit to the patient at the head of a struggling crowd of from 50 to 100 students, it is necessary on this account alone that wards should be large, and

* Very few small hospitals are really so healthy as large ones. Small hospitals almost always have small wards, and they hardly ever have more efficient ventilation than private houses. The new plan of setting up small hospitals in villages and country places (cottage hospitals, as they are called,) is an admirable one, on account of the superior care and nursing which such patients receive compared with what they would get at home; but it is a farce to compare such places to large roomy hospitals, considered abstractedly with reference to their relative fitness for the treatment of acute cases.

† See also what is said about fever wards in the chapter on "Regulations."

‡ We assume all along that the hospital and the wards are well ventilated, and that the latter are sufficiently high; when this is so, the above distance of the beds involves a sufficient cubic space; but it has been well shown that without a sufficient "surface area" cubic space is not enough for healthiness.

beds widely removed. Fortunately, so far the requirements of the school coincide with the requisites for healthiness.

We may say the same with reference to separate wards. Some patients there must surely be to whom the rush and noise of these visits must be injurious, and who ought to be sheltered from such an excitement. But here again the same details of construction would be dictated by other considerations. Nor need we spend time upon the arrangements of theatres and lecture rooms. They are necessary adjuncts to a medical school, but they have no direct bearing on the sanitary condition of the hospital. All arrangements for post mortem examinations, for the preparation of specimens, and still more for the conduct of dissections, ought to be placed beyond the main walls of the hospital building, and they are so in most of the hospitals we have visited which have a medical school attached. If, as at St. Bartholomew's, they can be entirely separated from those buildings, so much the better. This, however, is a matter now so well understood, that we have not noticed post mortem rooms in the immediate vicinity of the wards at any except the smallest country hospitals, where such examinations are rarely conducted.

Lastly, we have to consider what modifications in construction are necessitated by the out-patient department. On this point we shall say little, since it has not really a very important bearing on the sanitary condition of a hospital, though we believe its effect on the good management and comfort of the institution to be very considerable. The best plan is undoubtedly one by which the whole department is excluded from the general hospital, and the out-patients never come within its walls either for advice or for medicine.* This plan is evidently far superior to one by which the halls and staircases are periodically crowded with out-patients to the disturbance of the in-patients, and the possible contamination of the atmosphere of the hospital, and to the great discomfort of the out-patients themselves, from the over-crowding and confusion to which bad arrangements give rise. Consequently such arrangements are carried out in almost all the new buildings which we have visited, and ought to be a requisite in any plan for a new hospital. But many large hospitals, even in London,† have gone on for many years with most unsatisfactory arrangements in this particular, yet without manifest detriment to the health of the inmates.

In conclusion, it must be allowed that, great as the advantage to a hospital is of having all its parts well constructed and kept in scrupulous order and cleanliness, this will not render it entirely free from the diseases which infest hospitals, and which show themselves, in country hospitals even so beautifully constructed as that at Leicester, or at Maidstone, as far as we can ascertain, in about the same proportion to the urgency of the cases as they do elsewhere. Good construction, good ventilation, and the other matters spoken of in this chapter, will not protect a hospital from sporadic cases of erysipelas or pyæmia; but they will prevent those diseases from obtaining the mastery and prevailing endemically in the hospital, as they are liable to do if an attempt be made to treat acute diseases, in large numbers, in buildings not adapted for hospital use. Hence, the observance of such rules is necessary in hospitals intended for the treatment of the poor in large cities, and would be equally necessary in the country, if the country hospitals received the same class of patients.‡

* As in the new addition to the Radcliffe Infirmary, Oxford.

† St. George's may be taken as an example.

‡ In some of our hospitals, which are confessedly of faulty construction, surgical operations have the best success. This is peculiarly the case at Cambridge, and is,

HEALTH OF HOSPITALS.

Death-rate of Hospitals.

Among the simple points which statistics would seem capable of solving with some degree of accuracy may be included the number of admissions into hospitals, the number of deaths in hospitals, and consequently the death-rates of hospitals. And in fact, from the comparative ease and correctness with which the death-rate can be ascertained, and from the circumstance that it constitutes a really striking element of comparison, it has been made to play a very important part in all controversies which have arisen with regard to the healthiness of hospitals. Thus in the recent exacerbation of the chronic controversy as to the relative salubrity of the hospitals of Paris and of London, the comparatively high mortality occurring in the former institutions was regarded by many as of triumphant significance. And again, in the numerous discussions which have taken place, and in the numerous writings which have appeared upon the question of the health of military and other hospitals, difference of death-rate has been largely assumed to prove difference of healthiness. It is true that those who have enjoyed the best opportunities of acquiring hospital experience have ever fully recognised the valuelessness, per se, of the death-rate as a standard of comparison; and even Miss Nightingale, in the recent edition of her "Notes on Hospitals," while using "death-rate" and "unhealthiness" as equivalent terms, acknowledges that death-rates become seriously modified by a variety of conditions wholly unconnected with the salubrity of the institutions yielding them. Yet the public as a rule still look to the death-rates of hospitals as the best indication of their relative healthiness; and it is a rare thing, in discussions relating to hospital affairs, to find even skilled persons declining, when it suits their purpose, to appeal to a death-rate as a crucial test.

Since, therefore, the death-rate has been generally adopted as a standard of comparison, and the apparent healthiness of hospitals as indicated by it has been accepted as a tolerably accurate measure of the real healthiness of hospitals, it becomes important for us to go, under the guidance of the experience we have acquired, pretty fully into the question of the importance of hospital death-rates. And we do this the more willingly because such an examination into the value of the death-rate (a statistical item easy to obtain, and not, one should suppose, difficult to utilize,) will suggest some kind of notion of the difficulties and of the fallacies which necessarily beset the acquisition and the application of other far more abstruse medical statistical results.

We may concede, in limine, that if two hospitals resembled one another accurately in every particular but one, their death-rates, calculated for such a series of years as would neutralize any errors that might be attributable to mere chance, would in some degree indicate fairly the effects of that one point of difference upon the results of cases admitted respectively into them. If, for example, two hospitals of equal size, of identical construction and arrangement, identical in the amount of pressure on their beds, identical in the classes and proportions of

with much probability, referred to the good constitution and quiet habits of the agricultural population, and to comparative mildness of cases; most of the amputations and other operations being performed for chronic disease. The same success is also claimed for the old hospital at Bradford; but the statistics have not been preserved. With reference to the effect which the class of patients has on the result of treatment, the experience of the Southampton Infirmary may be cited. The patients consist partly of agricultural people, partly of sailors, many of whom are of dissipated habits and broken constitution, and who are found not to resist injury or operation so well as the others.

diseases admitted into them, and in the social condition of the populations from which their patients were derived, identical too in a variety of other circumstances which need not be detailed, differed essentially in respect of situation; it would be fair to assume that any difference of death-rate (calculated with the needful precautions) which they might exhibit would indicate a real difference of healthiness in their respective sites. But practically we know, that hospitals differ in a vast variety of particulars, and never in one particular alone; that no two hospitals are identical in all their conditions, and that many, quite apart from ordinary distinctions, have special features which may be easily overlooked by the mere statistician, yet may nevertheless exert a very decided influence over their mortuary rates. The simple case which we have supposed has no real existence, and the death-rate, instead of being the measure of a single influence on the health of hospitals, is in truth the sum of the influences of an almost infinite number of causes, all of which require to be duly considered and allowed for before any useful comparison can be made.

Among the chief of these influences may be enumerated: 1st, the position of hospitals in relation to the poor who make use of them; 2d, the pressure on the resources of hospitals in consequence of disproportion between the accommodation which they are capable of affording and the number of those applying for relief; 3d, the relative numbers of medical and surgical beds; 4th, the admission or exclusion of cases of infectious disease; 5th, the admission or exclusion of incurable affections; 6th, the admission or exclusion of those who are moribund or dead; 7th, the admission or exclusion of eye diseases, skin diseases, venereal complaints, and the like; 8th, the admission or exclusion of trivial cases; 9th, the system of admission by subscribers' letters, and on special taking-in days; and 10th, the carrying on of clinical instruction, or, generally, the degree of interest manifested by the professional staff of hospitals in the study of their profession.

1st. That the position which a hospital occupies in relation to those who avail themselves of its resources exerts, cæteris paribus, an influence upon the character of the cases admitted, and hence on the mortality of the institution, there can be no manner of doubt. It would be very difficult to demonstrate for any one institution the exact amount of influence which this circumstance exerts over its death-rate; but that it really does tend materially to modify the nature of the admissions into a hospital may be shown by a variety of examples. Thus, in our own metropolis, the London Hospital, which is placed in the centre of one of the densest and poorest districts, and in close proximity to the Docks, and a large variety of manufactories, receives a far larger number of serious accidents than any other hospital in London.* In Liverpool the Northern and Southern hospitals are, from their position, specially surgical hospitals. In Dublin, the Richmond Hospital, and two or three of the small hospitals, such as Jervis Street and Mercer's, which happen to be centrally placed, admit many more accidents and acute cases than such hospitals as Dr. Steevens's and the Mater Misericordiæ, which lie upon the outskirts of the town. In Paris again the same thing obtains, where the Lariboisière, St. Louis, and St. Antoine, planted in neighbourhoods analagous in some respects to that

* The total number of accident cases under treatment at the London Hospital during the year 1863 was 12,488; of these 2,180 were admitted into the house, and 10,308 attended to in the out-patient department. At Guy's during the same year the cases of accident amounted to 4,704, of which 866 were admitted into the hospital; and at Bartholomew's during 1862, 1,091 in-patient accident cases were under treatment.

Death-rate.

of the London Hospital, are pre-eminent among Parisian hospitals for the number of accidents received into their wards. It would be difficult perhaps to adduce equally striking examples of the influence of site on the admission of medical cases, although there can be no doubt that this influence must produce equivalent results. We may mention, however, as bearing upon the subject, that when we were in Dublin, typhus fever was very prevalent in the town, so much so that the Fever Hospital and the Hardwicke Hospital for acute diseases were full to overflowing with this disease. In Dr. Steevens's Hospital, however, which has two fever wards, containing 20 beds, there was one case of small-pox and one case of fever only, and there had been no run whatever on the fever wards.

2d. The pressure on the resources of a hospital, in consequence of disproportion between its size and the number of applicants for admission, must again materially influence the character of cases habitually received into it, and at the same time modify its death-rate. When a hospital has few applicants in proportion to the number of its beds, as is the case with most rural hospitals, patients are admitted with less regard to their fitness to become inmates, and are retained there ordinarily for a considerably longer period. But when, as in the case of Paris, London, and several of our large provincial towns, applicants are considerably in excess of the accommodation prepared for them; it necessarily follows that not only is a comparatively large proportion of urgent and serious cases admitted, but that patients suffering from trivial ailments are speedily discharged to make room for those who more urgently need hospital assistance,* and that even convalescents,

* The following table, which has been devised to show the numbers of occupants per bed per annum for each one of a series of hospitals in the metropolis, in provincial and in rural towns respectively, illustrates the statements made in the text. It will be observed that, although there are considerable variations, depending obviously on other conditions than the mere fact of a hospital being planted in an urban or a rural situation, there is yet a general and very decided tendency for patients to be retained in hospital for a longer period in the country than they are in large towns. The mean average number of patients per bed is, in the four metropolitan hospitals, 10·9, in the seven provincial hospitals 10·6, and in the 14 rural hospitals 8·05. The extremes are the Liverpool Royal Infirmary, in which each bed has, in the course of a year, more than thirteen successive inmates, and the hospital at Colchester, where each bed has less than six.

LONDON, 1862.

Name of Hospital.	Average Daily No. of Patients.	Total Patients per Annum.	No. of Patients to each Bed.
Charing Cross	93	950	10·2
St. George's	307	3,713	12·09
Guy's	494	4,883	9·80
London	364	4,164	11·4
Total	1,258	13,715	10·9

PROVINCIAL, 1862.

Bristol Royal	208	2,531	12·3
Birmingham Royal	205	2,035	10·3
Hull	90	971	10·78
Liverpool Northern	95	1,229	12·9
Liverpool Royal	189	2,473	13·08
Newcastle	178	1,566	8·8
Sheffield	145	959	6·6
Total	1,111	11,864	10·6

RURAL, 1862.

Name of Hospital.	Average Daily No. of Patients.	Total Patients per Annum.	No. of Patients to each Bed.
Brighton	127	1,064	8·37
Cambridge	73	637*	8·16
Canterbury	81	628	7·7
Carlisle	46	412	8·9
Colchester	45	263	5·8
Exeter	185	1,354	7·3
Gloucester	99	603	6·09
Hereford	71	554	7·8
Ipswich	38	240	6·3
Norwich	121	936*	7·7
Reading	80	731	9·1
Stafford	70	661	9·4
Taunton	77	726	10·79
Winchester	73	788	10·7
Total	1,191	9,596	8·05

* Average of three years.

with the same object, are discharged in a comparatively early period of their convalescence.

The effect of this circumstance on the death-rate is well shown in the history of the Liverpool Southern Hospital. Some few years ago, in consequence of defects in drainage and other matters, certain improvements were made, and the hospital was put into a better sanitary condition. At the same time want of funds compelled the managers of the institution to restrict the number of patients,* i.e. to refuse the less severe cases. The death-rate, which had been for the three years prior to these changes 4·8 per cent., increased in the three years subsequent to them to 6·06 per cent. St. Thomas's Hospital furnishes another case in point. At the latter end of 1862 the old hospital was closed, and a temporary hospital, containing less than half the number of beds, was made in the Surrey Gardens. This hospital has hitherto proved not less healthy than the old one, but the death-rate has increased from about 8 per cent. (at or about which figure it stood prior to the removal of the hospital) to 10 per cent., which was the death-rate during the year 1863. The small hospital at Maidstone affords probably another example. In the year 1862 important additions were being made to the institution, and the changes necessitated, we believe, some restriction with regard to the number of patients admitted. There was no unhealthiness in the hospital during the year, yet the death-rate exceeded 10 per cent. But no more interesting illustration can be adduced than that furnished by the following table, quoted from the 78th annual report of the Paisley Infirmary. The table shows that in the course of 15 years the death-rate of the institution has gradually diminished from 17·3 per cent. to 6 per cent. There is no evidence at all to show that the diminution of death-rate has proceeded *pari passu* with improvement of hospital salubrity; but there is abundant evidence to prove that it has followed on the gradual extension of the charity, and has been mainly dependent on the consequent admission into it of an increasing proportion of cases of comparatively little severity.

Year.	Admissions.			Total Average Mortality.
	Medical and Surgical.	Fever.	Total.	
1849 -	41	147	188	1 in $5\frac{3}{4}$
1850 -	106	156	252	1 „ $7\frac{2}{3}$
1851 -	243	180	423	1 „ $7\frac{3}{4}$
1852 -	294	326	620	1 „ $10\frac{1}{2}$
1853 -	429	252	681	1 „ $8\frac{1}{4}$
1854 -	461	226	687	1 „ $11\frac{1}{4}$
1855 -	397	101	498	1 „ 12
1856 -	410	96	506	1 „ $10\frac{1}{2}$
1857 -	523	322	845	1 „ 10
1858 -	479	121	600	1 „ $12\frac{3}{5}$
1859 -	519	74	593	1 „ $14\frac{6}{15}$
1860 -	645	104	749	1 „ 15·99
1861 -	617	98	715	1 „ 13·68
1862 -	476	102	578	1 „ 13·6
1863 -	591	144	735	1 „ 16·6

3rd. The proportion in which beds are allotted respectively to medical and surgical cases exerts a marked influence over a hospital death-

* The number of patients admitted in the three years preceding the improvements was 4,277, and in the three years subsequent to the improvements, 2,655.

rate. It is a well established fact that the mortality among the surgical inmates of a hospital is, with scarcely an exception, always considerably less than that among the medical inmates. The difference is well shown for Paris in the statisties prepared under the direction of M. Huśson, Directeur de l'Administration Générale de l'Assistance Publique—

PARIS. 1862.

	* Total Mortality per Cent.	Mortality of Medical Cases.	Mortality of Surgical Cases.
Beaujon	11·04	13·86	7·57
Hôtel Dieu	10·91	14·48	5·57
Lariboisière	11·92	15·03	7·49
Pitié	12·36	15·11	5·86

It is equally well shown for London in the table which we append—

LONDON. 1862.

	Total Mortality per Cent.	Mortality of Medical Cases.	Mortality of Surgical Cases.
Charing Cross	7·8	13·1	2·6
Guy's	9·61	14·49	6·16
London	7·4	10·4	6·3
St. George's	8·7	11·68	6·45

and is further confirmed by the selection of statistical records of country hospitals which we here subjoin—

COUNTRY. (1862 or 1861).

	Total Mortality per Cent.	Mortality of Medical Cases.	Mortality of Surgical Cases.
Aberdeen	4·9	8·04	2·3
Arbroath	12·4	17·8	3·0
Bath	7·9	9·3	6·4
Bristol Royal	5·2	6·7	3·7
Chichester	5·6	7·9	3·4
Dundee	7·0	10·7	3·0
Sheffield	9·5	14·6	6·3

The explanation of the differences in the relative mortality of medical and surgical cases is not far to seek. Surgical cases, especially those furnished by large manufacturing or seaport towns, comprise undoubtedly a considerable proportion of grave accidents, and other surgical emergencies, among which the mortality is generally very large. But with this exception the great bulk of surgical cases consists of affections of the surface of the body, or of parts accessible from without, affections which are not of a lethal character, or have only a remote tendency to a fatal issue. Indeed it frequently happens that almost the entire surgical mortality in a hospital depends on the deaths of the accident cases which have been admitted into it. Thus in 1862 the surgical mortality of the Charing Cross Hospital amounted, as is stated above, to 2·6 per cent.; but the mortality of accident cases amounted to 4·0 per cent., while that of other surgical cases was no higher than 1·6 per cent.; thus, also, in the South Staffordshire Hospital the total mortality, during 1862, was 9·3 per cent., but, the medical mortality was 7·7 per cent., the mortality of surgical cases admitted without letters (almost all of which were cases of accident) was 13·7 per cent., and the mortality of ordinary surgical cases 2·4 per cent.

* The mortality from the midwifery departments of the Paris Hospitals (which has been omitted from the table) combines, with that of the medical and surgical departments, to make the total mortality given in the first column.

Death-rate.

only.* Medical cases, on the other hand, even if (as in many of the country hospitals) infectious diseases be excluded, always comprise, in addition to a varying proportion of urgent cases, a large proportion of organic diseases of vital organs which necessarily tend directly, and often speedily, to a fatal result.

But be the explanation what it may (a point that really does not bear directly on our present argument), the fact remains undoubted that the mortality of medical cases is, almost invariably, much heavier than that of surgical cases; and hence, unless we take this fact into consideration in comparing the mortality of different hospitals, we must needs fall into errors of the grossest kind. M. Husson, in his recent work "Étude sur les Hôpitaux," arguing from this point of view, shows quite satisfactorily that those who have maintained that the French hospitals must be less healthy than the English hospitals because their death-rates are higher, have arrived at this conclusion on a purely fallacious basis. He admits that Guy's Hospital (taking that as a fair specimen of a London Hospital) has a mortuary rate of 9·20 per cent, while the general hospitals of Paris combined show a mortuary rate of 11·52;† but he points out that while in the English institution the number of the surgical beds surpasses that of the medical beds by one-third, the exact converse obtains in the hospitals of Paris; and that, on distinguishing the mortality due to medical and surgical cases respectively, the medical mortality in Guy's Hospital is to the medical mortality of the French hospitals as 14·08 to 13·52, and the mortality among surgical cases is favourable to the English hospital only in a proportion of 5·33 to 5·48. These differences are actually smaller than those found between different English institutions of known salubrity, and smaller than are shown in the mortuary experience of any one hospital during different years, as may be seen by comparing the data just quoted with those for the year 1862 in the preceding list. It is important to bear in mind that in almost all English hospitals a larger number of beds is allotted to the practice of surgery than to the practice of medicine, while in all Parisian and in most Scotch hospitals these proportions of medical and surgical beds are reversed.‡

* We have met with other exceptional cases, that of the Norwich Hospital being one, and that of the Lancaster Hospital another, in which the surgical death-rates have been unusually heavy, and have equalled or even surpassed the death-rates of the medical patients. But this has always been due to the fact of the admission of a large relative number of cases of accident or operation in combination with the admission of comparatively few ordinary surgical cases or of medical cases of little severity.

† The comparison is made between the experience of Guy's for the seven years 1854 to 1861 and the experience of the general hospitals of Paris for the same period.

‡ The appended list shows the proportions per cent. of medical and surgical cases treated during one year at the following Hospitals, arranged in classes:—

—	—	Medical.	Surgical.	—	Medical.	Surgical.
PARIS	Beaujon	64·5	35·5	Laribroisière	66·8	33·2
	Hôtel Dieu	68·4	31·6	Pitié	76·5	23·5
SCOTLAND	Arbroath	61·0	39·0	Greenock	65·9	34·1
	Glasgow	67·6	32·5			
LONDON	Charing Cross	44·1	55·9	London	31·09	68·91
	Guy's	40·9	59·1	St. Mary's	52·7	47·3
	King's	49·0	51·0	St. George's	43·9	56·1
PROVINCIAL	Hull	45·1	54·9	Manchester	32·4	67·6
	Liverpool North	15·1	84·9	Newcastle	32·9	67·1
RURAL	Bath United	50·9	49·1	Reading	35·56	64·44
	Maidstone	45·5	54·5	Salisbury	46·2	53·8

Death-rate.

4th. Again, the admission or exclusion of cases of infectious diseases forms a very important item in regulating the mortality of a hospital; and this not merely because infectious diseases, such as typhus and small-pox, present normally a far larger per-centage mortality than most other cases admitted into hospitals, but because practically, the admission or non-admission of this class of affections regulates in no small degree the admission of other acute medical diseases. Thus, if it be the regulation of a hospital that no cases of fever be admitted, and this regulation be enforced, not only do actual fever cases cease to apply, but all those cases which by the lay public are ordinarily regarded as fevers, all those cases (and they are numerous) in regard to which a skilled medical practitioner would hesitate perhaps to commit himself on the moment to an opinion, cease also to apply. So that the hospital which declines to receive fever cases into its wards, ceases in large proportion to receive cases of acute internal inflammation which really form the great bulk of the urgent cases which physicians are called upon to treat. How greatly the admission of infectious diseases determines the admission of other urgent medical cases is clearly shown by the published records of cases admitted into so-called fever hospitals. Thus, on looking to the report of the London Fever Hospital for 1861, we find that out of 646 cases admitted during the year, (while 473 were cases of typhus, typhoid, scarlet fever, or measles) 173 were cases of non-infectious acute diseases. What these cases were is not distinctly stated, but their character may be judged of by the subjoined list of the causes of death in those cases among them which proved fatal; and their severity and acuteness are proved by the fact, that while the general mortality of the hospital for the year was 18·2 per cent., the mortality of the 173 non-infectious cases amounted to 28·3.

Apoplexy	2	cases.
Acute hydrocephalus	5	,,
Abscess of the brain	1	,,
Tumour at the base of the brain	1	,,
Disease of temporal bone	1	,,
Phthisis, or acute tuberculosis	10	,,
Pleurisy	1	,,
Pleurisy and pneumothorax	1	,,
Pneumonia	5	,,
Disease of the heart and pneumonia	4	,,
Disease of the heart and kidneys	5	,,
Disease of heart and kidneys and hydatids of liver	1	,,
Disease of kidneys	5	,,
Disease of kidneys and bladder	1	,,
Cirrhosis of the liver	1	,,
Cancer of the intestine	1	,,
Puerperal fever	1	,,
Pyæmia	2	,,
Debility	1	,,
	49	,,

Again, on analysing the list of cases admitted into the Cork Street Fever Hospital, Dublin, for the year ending March 31st, 1862, we find that out of 1,666 admissions there were 943 cases of fever, 45 of measles, 10 of rubeola, and 4 of small-pox, and that the remaining 664 comprised 435 cases of bronchitis, 26 of diarrhœa, 23 of delirium tremens, 21 of phthisis, 18 of tonsillitis, and in smaller numbers a great variety of other more or less important maladies. Or, to quote

the experience of the Greenock Hospital which contains 119 beds, and has connected with it a fever house of 70 beds into which infectious fevers are admitted; it is true that in the year ending April 1862 the great majority of cases treated in this department of the institution were such as it is designed to receive, but the accompanying list shows quite clearly that acute affections of a totally different kind are habitually admitted into it.

Apoplexy	1
Brain, disease of	1
Bronchitis	3
Cephalalgia	1
Diarrhœa	3
Epilepsy	1
Febricula	23
Fever, chiefly typhus	196
„ Typhoid	3
„ Intermittent	1
Gonorrhœa	1
Mania	2
Measles	1
Peritonitis, tubercular	1
Phthisis	1
Pleuropneumonia	3
Pneumonia, typhoid	4
Rheumatism	1
Scarlatina	1
Small-pox	6
Total	254

The facts above adduced demonstrate in a striking manner that the admission of fever cases into a hospital involves the admission also of a large proportion of the other emergencies of medical practice. The converse might be safely assumed to be true; but its truth is directly proved by the experience of those of our country hospitals from which infectious diseases are by rule excluded. Thus in the case of the Cumberland Infirmary at Carlisle (in which town there is a special fever hospital), notwithstanding that fevers and a fair proportion of other acute affections occur among the labouring population, the medical cases which apply for admission are purely chronic, and for the most part trivial. In the case of the Exeter Hospital, again, which is the hospital for a large town and for a considerable area of surrounding country, the hospital, though large and with ample accommodation, admits scarcely any medical cases of the slightest importance. The same in a yet more marked degree is the experience of the Essex and Colchester Hospital. It is idle to assert that in the above and similar examples no acute cases are admitted, because there are no acute cases to be admitted; for although it may be possible that certain affections prevail more in towns than in the country, it is certain that the emergencies of medical practice, pneumonia, pleurisy, apoplexy, acute bronchitis, rheumatic fever, and a host of other acute maladies, are dependent for their causes on other conditions than those peculiar to cities, and that they prevail in fair proportion even in districts reputed to be the most salubrious.

But how greatly the admission of fever cases adds to the death-rate of an institution, and how utterly absurd and childish it is to compare hospital death-rates without taking this element into consideration,

may be clearly shown by contrasting the statistical records of a few hospitals taken almost at random. The House of Industry Hospitals in Dublin comprise three buildings, one for surgical cases, one for ordinary medical cases, and the third for acute diseases (including fever). The death-rates in these buildings, for the year ending March 31st, 1862, were for the surgical house 3·5 per cent., for the ordinary medical 6·1, and for the institution for acute affections 8·1. The Meath Hospital again in the same city presented for the same year a total death-rate of 4·6 per cent.; but in the fever cases alone (which are received into special wards) the mortality amounted to 9·4 per cent. The hospital at Stafford has a special fever department. The mortality for the whole establishment was during 1862, 7·5 per cent.; but the per-centage of deaths among the fever cases amounted to 25; and that of all the cases (exclusive of fever) to 6 only. Pretty nearly the same result is afforded by the experience of the Derbyshire General Infirmary, where, over a period of three years, the general death-rate of the institution was 4·9, and that of cases admitted into the fever wards 17·3. Or, to take a far more important hospital than most of those we have instanced—the Glasgow Infirmary: for the year 1862 the death-rate for the whole institution amounted to 10·3 per cent.; but the death-rate in the fever wards was 16·7, and that of the hospital (excluding fever cases from computation) 8·7 only.*

5th. There is a common rule in English Hospitals, especially in those of country districts, that patients with incurable diseases, shall not be admitted, or if admitted accidentally shall be discharged. Now such diseases include organic affections of the heart in their later stages, advanced Bright's disease, cancerous affections, and especially confirmed phthisis. It is notorious that the affections here enumerated, and one or two others belonging to the same category, constitute (as well in the country as in towns) the chief causes of death in those who have passed beyond the age of puberty; and it is obvious that if those who are labouring under them are refused admission into a hospital, or are admitted only to be discharged as soon as dangerous symptoms appear, the hospital is at once freed from those causes of death which constitute so large a proportion of the mortality of hospitals conducted on a less exclusive principle. In several of the London Hospitals there is a rule which tends to the exclusion of phthisis; but that the rule in their case is practically disregarded is shown by the large number of phthisical cases admitted into them and the large proportion of phthisical deaths. Thus by the published report of St. Thomas's Hospital for 1860 we find that there were 192 cases of confirmed phthisis admitted in the year, and that of these 68 died; in the report of Guy's Hospital for the year 1862, 181 cases of phthisis are enumerated, with 63 deaths; it appears also that there were admitted during the same year, into St. Bartholomew's, 140 cases of phthisis, of which 76 proved fatal. Now, to show how large an influence this disease has upon the mortality of these institutions we may point out that their respective death-rates for the years above specified were 9·5, 9·6, and 11·1 per cent.; but that if the phthisical cases, and the deaths belonging to them, be subtracted, the death-rates (taken in the same order) become reduced to 8·1, 8·6, and 10·0. In the hospitals of Paris the proportion of phthisis admitted

* The same is shown in the experience of the hospitals at Bedford, Montrose Paisley, and other towns.

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would seem to be even larger. In the Hôpital Lariboisiere 235 deaths from this disease were recorded in the year 1861. So too, doubtless, in some of the extra-metropolitan hospitals of Great Britain, phthisical cases are freely and abundantly admitted; in the Glasgow Infirmary, for example, there were in the year 1862, 76 deaths from this disease; and in the Derby Hospital there were 30 deaths from the same cause in the course of three years. But in a large number the rule referred to is carried out with considerable stringency, and the result is that phthisis is almost unknown in the bills of mortality, and a deceptive lowness of death-rate is the result. To cite an example; the Salop Infirmary, with 133 beds, and (in 1862) 1,030 admissions, presents for that year a death-rate of 3·98 per cent. and among the deaths two only are ascribed to phthisis. Now, had cases of phthisis formed a proportion of the whole number of cases admitted equal to that which obtains in St. Bartholomew's, St. Thomas's, or Guy's, the deaths due to this affection alone would have amounted to about 20, and the death-rate would have been increased from 3·98 to 5·7.*

In short, it stands to reason that if patients in the last stages of incurable diseases are freely admitted into hospitals and retained in them, the death-rates must be proportionately, and often largely increased; yet the actual healthiness of such hospitals will be manifestly in no degree necessarily affected by any increase of the kind, however great it may be. No one would consider the hospital at Brompton as unhealthy because its death-rate varies from 13 to 19 per cent.; no one would consider the Dublin Hospital for Incurables a pest-house because during one year there were 24 admissions and 13 deaths; or regard (which would be scarcely less absurd) the order of the garter as a fatal gift, because the death-rate, calculated on the admissions, amounts to 100 per cent. It equally stands to reason that those institutions which habitually exclude such cases secure for themselves a diminished death-rate, but obviously secure for themselves by this means no actual advantage of health. And it is certain, as we have shown, that many country hospitals actually do owe, in great measure, the lowness of their death-rates to such an exclusion as that which we have been discussing.

It will be observed that our illustrations have been drawn alone from phthisis, and its effects on the death-rates of hospitals. Our reasons for making this selection are, 1st, that phthisis is a disease which produces actually more deaths than any other single chronic malady, and, 2nd, that the diagnosis of phthisis is generally so simple that, as respects this disease at least, the numerical statements published by various hospitals may be regarded as not being very inaccurate. But it must not be forgotten that those institutions which by their rules or their practice exclude or dismiss cases of phthisis likely to be fatal, exclude or dismiss also, in a pretty nearly equal degree, cases (in an advanced stage) of other forms of chronic disease, such as old bronchitis, chronic heart disease, advanced disease of the kidneys, and particularly all dropsies.

6th. There is another rule, equally common with that the effects whereof we have just discussed, in virtue of which moribund or dead persons are refused admission. No one supposes that a dead body is suitable to become the occupant of a hospital bed; but any one can see what the effect of a rule excluding dead or dying persons is likely to be, not only on the cases actually admitted into the charity which

* Among other similar cases may be mentioned the hospitals at Carlisle, Ipswich, and Reading; in the latter of which, among the deaths for one year, none is attributed to phthisis.

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adheres to it, but on the cases brought to it as claimants for admission. Cases of apoplectic seizure, of poisoning, of drowning, and of many other forms of extreme emergency would doubtless still be admitted if they were brought; but they cease to be brought. In the case of St. Bartholomew's, during the year 1862, 19 persons were brought dead to the hospital and 88 died within 24 hours of admission, forming together a little more than one sixth of the total mortality of the institution. It can scarcely be supposed that any of these died of hospital influences, and yet they add most seriously to the hospital death-rate. But this is not a special instance in the history of St. Bartholomew's. In the year 1861, 21 patients were brought in dead, and 82 died within 24 hours of admission; and in 1860, 19 were admitted dead and 82 died before the lapse of one entire day. To take the London Fever Hospital; in the year 1862, 2,699 patients were admitted and 472 died; but of this latter number two were dead on admission, 41 were moribund on admission and died within 24 hours, and 54 others died before the completion of 48 hours. The subtraction of these deaths, which were all doubtless wholly unpreventable from the moment of admission into the hospital, would reduce the death-rate of the year from upwards of 17 per cent. to 14·6 per cent. only. We select one more example: the Charing Cross Hospital is a small hospital, and admitted, during the year 1860, 857 patients. Of these 92 died, yielding a mortality of 10·7 per cent.; but 10 of this number were brought in dead, and if these be subtracted the mortality at once sinks to 9·6. Doubtless a fair proportion of others were moribund at the time of admission, but of these (as they are not specially pointed to in the hospital books) we, in our own estimate, have necessarily taken no account. Now in the London hospitals generally there is no rule tending to exclude dead or dying cases. The public knows the fact, and acts upon it, and consequently a large proportion of the sudden deaths and illnesses occurring in the streets or elsewhere are as a rule at once carried to the nearest hospital. The same is the case as regards the hospitals of some of our large provincial towns, and in a few of those which go under the name of country hospitals; but in the majority of these latter institutions the rule not only exists, but is enforced, and we have several times been informed by house surgeons (and the hospital records have for the most part amply confirmed such statements), that dying cases are really never admitted wittingly into the wards.

7th. The admission of certain other classes of diseases, which in their nature are rarely or never fatal, is capable of exerting, and in many cases actually does exert, an important influence upon death-rates. The classes of diseases to which we refer are, specially, skin diseases, eye diseases, and syphilitic affections; and to the list we might add obstetrical cases. That the "normal" mortality (if the expression may be used) of each of the above classes is very small can very easily be shown, and it becomes then an obvious and perfectly fair deduction that all those institutions which admit in large proportion such maladies must thence acquire a sensible reduction of death-rate. The Hôpital St. Louis, in Paris, which contains 792 beds, has 604 devoted to the reception of skin diseases. The mortality per cent. among patients admitted into these beds was in 1862, 2·4 per cent. only, and there was nothing special about the death-rate of this particular year. In St. Mark's Hospital, Dublin, 216 cases of eye diseases were admitted during the year ending September 30th 1862, and apparently no death occurred there. So, in the statistical reports of Guy's Hospital for the year 1862, 395 eye cases are recorded, not one of which proved fatal. To pass on to venereal affections, the Lourcine (the female Lock hospital of

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Paris) contains 248 beds, and the Midi (the male syphilitic hospital) 336. The mortality in the former during 1862 was 1·26 per cent. only, and the mortality in the latter was no higher than ·48 per cent. In the Westmoreland Lock Hospital of Dublin the death-rate was only ·86. Finally, as regards obstetrical cases, in the year 1860 the mortality per cent. in the Rotundo Lying-in Hospital of Dublin was 1·55 only, and in the Coombe Lying-in Hospital of the same town 2·5 ; and for many years previously the mortality had varied within these limits. But it must be acknowledged that the mortality occurring among puerperal women in hospitals is after all liable to great variations ; for, in the Rotundo Hospital, in the year 1861–62 (when there was a severe epidemic of puerperal fever), the mortality amounted to no less than 8·13 per cent., and in the Paris hospitals a still higher per-centage is not unfrequently attained.

But, practically, lying-in cases may be excluded from our present argument, since none of the general hospitals, excepting King's College, in Great Britain admits them. It is very different, however, as regards the other three classes of affections which we have enumerated. There are many hospitals in this country where one or more of them are habitually admitted, and others again from which for the most part they are excluded. Thus in the "Dreadnought" hospital ship, out of a total of 203 beds, 80 are devoted to syphilitic patients. In the Royal Free Hospital, out of 100 beds, 24 in a Lock ward are set apart for the reception of female syphilitics.* In Guy's Hospital 451 patients were admitted in the course of the year 1862 into the venereal wards, and 395 into the beds attached to the ophthalmic department. In St. Bartholomew's, during the same year, 497 venereal cases were admitted, but only 45 cases of affections of the eye. In St. Thomas's Hospital, during 1860, 383 cases were received into the venereal wards, and 84 into those appropriated to ophthalmic surgery. Now it is obvious that these circumstances must affect the death-rates of these institutions, especially the death-rates of the two first named (which are comparatively small hospitals), and that in contrasting their results with those (say) of the Charing Cross Hospital, which excludes syphilitic cases, they must not be wholly disregarded. Again, if we have regard to other than metropolitan hospitals, we find that some make special provision for the reception of eye cases, venereal cases, or both ; that many make no provision for either ; and that many absolutely exclude all persons suffering from syphilis from any participation in the benefits they have to bestow. Thus in the hospital at Derby 20 beds are set apart for venereal cases ; in the Nottingham Infirmary also beds are appropriated to those suffering from such complaints. But syphilitic cases are excluded from the Bath United Hospital and from the hospital at Colchester. It should be observed, however, that the mere setting apart of wards for syphilitic patients (especially those of the female sex) by no means implies that such patients are admitted in anything like proportion to the accommodation provided for them ; for in several country hospitals (as at Chester, for example,) they can only be admitted by governors' letters, and for these, as might be supposed, they very rarely venture to apply ; and on the other hand special circumstances (apart from any specific rule) often determine the admission into certain hospitals of diseases of a particular class. Such is the case in the Exeter and Devon Hospital, where skin diseases constitute a large proportion of the cases which come under the care of the physicians.

* The death-rate of the Dreadnought has, during several years, varied from 4·4 to 6·5 per cent. ; that of the Royal Free Hospital is generally a little over 7.

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9th. The admission or exclusion of trivial cases, by which we mean (on the physicians' side of the hospital) chronic dyspepsia, incipient phthisis, hypochondriasis, hysteria, amenorrhœa, "debility," and a number of nervous and other disorders which frequently come under the care of the medical practitioner, but to which names can scarcely be assigned, and (on the surgical side) ulcerated legs, varicose veins, chronic joint affections not demanding operation, trivial injuries, such as cut and broken fingers, and the like—the admission or exclusion of such cases as these unquestionably forms one of the great distinctions between the hospitals of large towns and those which are usually termed country hospitals; but it is one of those distinctions which reveal themselves far less in tabulated reports of disease than they do in the actual inspection of the patients in hospitals. For in mere reports 10 cases of phthisis in one hospital stand as the equivalent of 10 cases of phthisis in another hospital; but where in the one instance the admission of cases is determined by special hospital rules and by governors' letters of recommendation, and in the other is regulated solely by the relative needs of applicants, the almost necessary result is that in the former instance 9 out of the 10 cases of phthisis will be cases of incipient or suspected phthisis only, while in the latter 9 out of the 10 will be cases of the disease in an advanced or urgent form; so of rheumatism, so of bronchitis, so too of the majority of medical complaints. Similar observations apply to the surgical cases received into different hospitals. A strangulated hernia, a compound fracture, forms an equally serious case in whatever hospital it may happen to be found; but it depends on a great variety of conditions whether the 10 "strumous" joints placed on the records of one hospital are the equivalent of the 10 "strumous" joints placed on the records of another hospital. These are cases which, as every one knows, continue frequently in a chronic form for years; but it makes all the difference in the world as regards the death-rate of the hospital, whether they be admitted during an exacerbation of the disease or during a quiescent stage, whether they be admitted simply to afford them a little rest, or whether they be admitted for the sake of undergoing operation.

Amongst trivial cases must also be included classes of individuals who are admitted by special arrangement into certain hospitals. Thus we find that occasionally special wards* are appropriated to the reception of subscribers' servants; that in other cases (and this is so particularly in the Irish hospitals) a number of beds in special wards are reserved for the use of those who are disposed to gain admission by payment; that here and there, as at Dumfries, wards are set apart for the Militia; and, again, that in other hospitals (as at Dr. Steevens's Hospital, Dublin,) a certain portion of the building is devoted to the exclusive use of the Constabulary. That such conditions as these tend to the reduction of the death-rate there is no doubt, and indeed in the last of the examples just quoted the effect is very striking. In Dr. Steevens's Hospital (which is undoubtedly in almost all respects an excellent hospital) the death-rate is habitually very low. But the hospital contains 223 beds, and of these no less than 74 are used by the Constabulary alone. In the year 1861–62 the total admissions into the hospital were 2,395, the deaths were 68, and the death-rate consequently was 2·8 per cent. only. But a closer inquiry reveals the fact, that the gross results above given comprise 870 policemen admitted and nine policemen dead; and that if these numbers be deducted (as in a comparison of this hospital with others they should be) the death-

* As at the United Hospital at Bath.

Death-rate.

rate, instead of being only 2·8, becomes 3·8 per cent. The mortality of course is still very low, but there are many circumstances, needless to mention here, tending to produce this result.

9th. We have already drawn attention to the effect which systems of admission exercise upon the medical and surgical practice of hospitals. We have shown that admissions limited to special days, and especially the plan of admission by governor's letters, tend (especially in rural hospitals), to fill the hospital beds with chronic or trivial cases, which are retained in the house, not for any actual benefit they are likely to receive, but out of deference to the recommendations which secured their admission. What effect such rules must exercise over the death-rate is obvious, and admits of demonstration. The hospital at Arbroath in Scotland is a small, clean, well arranged, and not ill-constructed building; it occupies an admirable site, outside the town, and overlooking the sea—the very spot for a convalescent hospital. It makes up 60 beds, and in the year 1862, 170 patients were treated in it to a termination. Of these 22 died, yielding a death-rate of 12·4 per cent. The death-rate of medical cases was 17·8 per cent. There was nothing special in the experience of the year. A general death-rate, not very different from the above, has been habitual for a considerable period. Provision is made for the reception of fever cases, but the rate of mortality of fever cases was less during the year than that of the other medical cases; moreover, no spread of fever had taken place; no erysipelas or pyæmia had carried off surgical operations. The hospital itself was perfectly salubrious; and yet here, in a purely country hospital, we find a death-rate surpassing that of almost any London hospital, instead of a death-rate of 3 or 4 per cent., such as is common in the rural hospitals of England, and is found even in the notoriously unhealthy hospital at Winchester.* The reason is a simple one; the medical attendants at the hospital are the parish doctors of the town, who attend at their own homes all the sick of that class from which hospital patients are derived; and the patients in the hospital are admitted not by governors' letters, but by the medical men themselves, who send to the hospital those cases which, in their judgment, most need the benefits which a hospital is capable of affording. We may add, that generally in the hospitals of the smaller Scottish towns the relative mortality is considerably higher† than in English country hospitals, and that the rules which regulate the admissions are very similar to those of the hospital at Arbroath.

But there are a few English hospitals in small towns where similar practices with respect to the admission of patients prevail, and where (wholly independently of unhealthiness) like results ensue. Among these we may enumerate the hospital at Whitehaven, with 54 beds, and a death-rate, in 1862, of 9·3 per cent., and, in 1861, of 9 per cent.; and the Lancaster House of Recovery, with 27 beds, and a death-rate in 1862 of 9·2 per cent.

10th. That because a hospital is a school of clinical instruction, or because it has attached to it a staff that takes a deep interest in the study and enlightened practice of their profession, its mortality should become in some degree modified, would very likely be generally conceded as at least a not improbable consequence. The non-professional public would doubtless surmise that the death-rate would be modified in the sense of diminution. Medical men, however,—certainly

* The death-rate at this hospital was, in the year 1862, 2·2 per cent.

† The following are the death-rates at some of the small Scotch hospitals:—Greenock 11·7, Montrose 6·, Paisley 7·3, Perth 7.

those of hospital experience,—know that the modification would on the contrary be one of decided increase. Medical skill, though it doubtless exerts a beneficial influence in a great variety of ways, exerts it in the sense of saving life exceptionally only; and the few lives thus saved annually in a large hospital are really, as affecting the death-rate, of little or no account, and necessarily of still less account in comparisons between one institution and another. But the other effect flowing, not absolutely from skilful treatment, but from the reputation of a hospital, and from the interest taken in their duties by members of the hospital staff, is of a very different kind, and undoubtedly exerts what may be termed a very unfavourable influence indeed over the death-rate.* A hospital which enjoys a high reputation has, in addition to the serious cases which it attracts normally from a limited area, numerous selected cases, of a serious nature, habitually transmitted to it by medical men (old pupils and others) residing at a distance. This is the case with the London hospitals generally, and in a very marked degree it is the case with the Royal Infirmaries of Edinburgh and Glasgow, with the Leeds Infirmary, and with some half dozen other hospitals that might be readily mentioned. Again, in hospitals of this class, the exigencies of clinical instruction impel those officers who take an interest in their duties to select for treatment the most serious and urgent cases, this selection being accomplished, not alone by actual choice in the admission rooms, but in great measure by the speedy discharge of inappropriate and of convalescent patients. And, lastly, the efficient performance of these same clinical duties leads (with no thought to the death-rate) to the retention of dying patients. Patients, instead of being sent home to die, are retained in the hospital until the fatal event occurs. Now, any one who knows anything at all of the internal working of such hospitals as those above referred to, and of hospitals which have no school of medicine attached to them, especially country hospitals, knows full well that in the several conditions which we have just considered the two classes of hospitals are as wide asunder as the poles; and that in the latter class serious cases are not only habitually not admitted, but cases about to die are habitually removed home from the hospital before the occurrence of death.†

* But although the reputation of a medical school does no doubt increase the death-rate, by attracting a larger number of serious cases to the hospital, it would be an error to attribute to this cause any such preponderating influence as has by some been claimed for it. If we take King's College Hospital, which undoubtedly enjoys considerable reputation as a school of medicine, and compare it with the Royal Free Hospital, which has no medical school, we find that the death-rate of the former was, in 1861, 10·7 per cent., while the death-rate of the latter was, for the same year, 6·8 per cent. The difference was not improbably due in some degree to the cause above referred to; but when it is considered that at King's College the number of medical and surgical cases admitted during the year was as nearly as possible equal, while at the Royal Free Hospital three times as many surgical as medical patients were admitted for treatment; that at the former institution infectious diseases are received, while at the latter they are excluded; and that the former has no venereal wards, while the latter had at the time 24 beds (out of a total of 84) assigned to female syphilitis, it is obvious that their differences of death-rate depended largely on other causes than that of the relative reputation of the institutions.

† Similar differences, arising from the same causes as those which determine the differences above specified between town and country hospitals, may be observed in town hospitals even in the practice of different members of the same staff. The fact is well known, and were it not invidious it would be easy to show from numerous instances that the mortality in the wards of a painstaking clinical teacher is, as a rule, considerably higher than the mortality in the wards of his perfunctory colleague. One case we are permitted to quote: Dr. Corrigan, President of the College of Physicians of Ireland, informs us, that when, many years ago, he and another young physician were appointed to the Whitworth and Hardwicke hospitals, it was observed before

It would not be difficult to adduce many other circumstances (such as relative proportions of the sexes admitted, difference of constitution between those who live in the country and those who inhabit manufacturing towns) which have been known to, or which may, affect the death-rate, and which doubtless do in various cases, and in various degrees, affect it still. Our object has been to avoid the danger of bringing forward what might be regarded as merely ingenious objections to the acceptance of the death-rate as a standard of salubrity, and to rest our argument alone on those general conditions which have impressed us in the course of our investigations, and of the influence of which we have conceived ourselves able to adduce some tangible proof.*

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But the death-rates of hospitals are not merely liable to all these sources of disturbance, which may be regarded as natural; they are actually in many cases falsified. In using the term falsification we do not mean to impute any bad motive; but there is a tendency, especially powerful in the case of subscription hospitals, to parade on the one hand the large number of patients they have had under treatment, and to show on the other the great amount of benefit they have bestowed upon them. Thus, in the majority of hospitals, it is we believe the custom to reckon among their deaths those who have been brought dead to the institution; but there are many hospitals where such cases are not reckoned, and there are some indeed where even those who die within 24 hours are, on the ground that they were moribund at the time of admission, excluded from computation. Again, in many hospitals it is the practice to specify in the reports the total number of cases under treatment during the year, including in this phrase not only those who were actually admitted, but those cases (admitted in the previous year) that were in the wards at the commencement of the hospital-year. To this, of course, no one can object; but it happens, and not very unfrequently, that the death-rate is calculated on this total number of cases under treatment, instead of being calculated on the admissions alone, or on (what is yet more correct) the cases treated to a termination. Further, there is another practice, still more pernicious, which we know is far from uncommon. It is that of giving to patients, after they have been six weeks or two months in hospital, renewed tickets, and counting them from that time as new admissions. The result is that in the annual summary a certain number of individuals, amounting it may be to one sixth or even to one fourth of the actual number of admissions, are reckoned and dealt with statistically as two patients. Thus in one instance, out of 626 nominal patients no less than 169 were duplicates. Including this latter number in the computation the death-rate was 4·7, excluding this number it mounted up to 6·5. Now the effect of any one of these modes of

long by the governors of these institutions that the mortality in their wards was greatly in excess of that occurring in the wards of their two senior colleagues, and their attention was drawn to this momentous fact. The explanation, however, was very soon given, and was accepted as satisfactory. It was simply this, that the two younger physicians looked upon their hospital as a place for instruction (teaching and learning), while the two senior physicians cared for it only as affording them a certain professional status; and that, consequently, all acute and urgent cases were admitted into the wards appropriated to the former, while the latter took charge only of those patients who were suffering from chronic or from trivial affections.

* We cannot resist quoting (as an example of the serious effects of even ridiculous causes on the apparent healthiness of wards) a case in which, some years ago, it was observed in one of the Dublin hospitals that the wards on the ground floor had constantly a far higher mortality than those on the floors above. The greater unhealthiness of the ground floor was assumed to be a fact, until it was discovered that the porter of the hospital, who seems to have had the power of determining into what wards patients should go, had been in the habit of putting all those patients that could not walk into the wards below, and of sending all those that could walk into the wards above.

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falsifying the statistical results of a hospital is of course to diminish the death-rate of the institution, and in some cases (as is shown in the instance we have adduced) to cause a very considerable diminution.*

To the above arguments it may be replied: "The death-rate, no doubt, "is liable to be modified by all those influences the effects of which you "have been discussing; but the differences between the death-rates "of various institutions are far too great to be wholly dependent on "such causes as these; moreover, where the modifying influences are "so various, they, doubtless, to a considerable extent, neutralize one "another, so that we are still disposed to take the death rate as a "not very unfair exponent of hospital salubrity."† Now, against any

* There are other modes of falsification, which imply actual dishonesty, but which we believe to be very rarely practised, and which consequently can have no appreciable influence on the death-rate. Thus in one institution, which shall be nameless, we were assured that one of the surgeons had been known, in a case of operation about to end fatally, to take down the original ticket, and to supply the patient with a new one, in order that the case might be counted as two, viz., 1st. a case of successful operation, and, 2nd. a case of death from erysipelas, or whatever the immediate cause of death may have been. We give this statement as we received it, but do not pledge ourselves as to its truth.

† That there is an absolute difference in the *quality* of the causes of death (and, inferentially, therefore, in the quality of the cases admitted) in metropolitan and rural hospitals, is shown in the appended table. We have taken three metropolitan hospitals and 12 rural hospitals for comparison; and have taken them without any other selection than was forced upon us by the circumstance of our having the records of these hospitals ready at hand. We have divided the deaths into medical and surgical, and have sub-divided these classes, in the former case, into acute and chronic, in the latter case into deaths arising from injury, deaths due to operations and acute affections, and deaths from chronic diseases. The division is necessarily rough (among other causes) from the imperfection of the records themselves; but we have taken care, as much as possible, to avoid error. As far as it goes, the table shows the far lower proportion of acute medical diseases in rural than in London hospitals, but, as regards surgical practice, much less difference than might have been expected. It must be borne in mind, however, that the table shows only the relative numbers of *deaths* due to the specified forms of disease and injury, which is, of course, quite a different thing from the ratio between the numbers of deaths and the numbers of patients admitted for treatment. As regards medical deaths, the contrast might have been made more striking had we selected for comparison London hospitals, which admit infectious diseases. Two out of the three in the table exclude infectious fevers.

TABLE of Causes of Death at certain London and Rural Hospitals.

	Total Deaths.	Medical Deaths.				Surgical Deaths.					
		Acute.	Chronic	Acute per Cent.	Chronic per Cent.	Injury.	Operation and Acute.	Chronic.	Injury per Cent.	Acute per Cent.	Chronic per Cent.
LONDON.											
Charing Cross -	68	14	40	—	—	9	3	2	—	—	—
St. George's -	319	89	108	—	—	63	42	12	—	—	—
London -	315	60	74	—	—	89	75	17	—	—	—
Total -	702	163	222	42·3	57·7	166	120	31	52·37	37·85	9·78
RURAL.											
Barnstaple -	37	5	12	—	—	9	9	2	—	—	—
Canterbury -	16	2	11	—	—	1	3	1	—	—	—
Carlisle -	40	1	13	—	—	14	10	2	—	—	—
Cheltenham -	16	4	10	—	—	—	2	—	—	—	—
Chichester -	19	3	10	—	—	3	3	—	—	—	—
Colchester -	35	5	20	—	—	7	2	1	—	—	—
Exeter -	49	4	20	—	—	6	12	7	—	—	—
Gloucester -	31	2	16	—	—	6	7	—	—	—	—
Hereford -	54	3	31	—	—	7	9	4	—	—	—
Lincoln -	64	4	24	—	—	8	23	5	—	—	—
Northampton -	33	1	24	—	—	8	—	—	—	—	—
Norwich -	53	7	21	—	—	15	8	2	—	—	—
Total -	449	41	212	16·2	83·8	84	88	24	42·85	44·9	12·25

such assumptions and any such conclusions as these, we must record our emphatic protest. For, in the first place, we are convinced that anyone who considers very carefully the evidence we have adduced, and especially any one who takes the trouble to conduct for himself such an investigation as that in which we have been engaged, must arrive with us at the conclusion that the condition of the death-rate is, with rare exceptions, almost wholly independent of hospital salubrity. And, in the second place, we aver that it is wholly illogical to maintain, and utterly untrue, that the various modifying influences neutralize, or even tend to neutralize, one another. No one has the right arbitrarily to assume, that where a death rate is shown to be under the influence of a number of various conditions (of which the healthiness of hospitals is one only), all these influences, but one which he may choose to distinguish from the rest, neutralize one another, and that any variation which the death-rate may present must be due to this selected influence. The point is one to be proved, and not to be taken for granted. In conclusion, we do not hesitate to draw from the condition of the death-rate of a hospital a very different inference from that which it is fashionable to draw. We do not infer that a high death-rate is a sign of healthiness (for this, of course, we have no warrant); but we do draw this inference, and we are satisfied of its foundation in fact, that a high death-rate indicates, as a rate, that a hospital fulfils efficiently the purposes for which it was designed, and that a low death-rate, on the other hand, indicates (cæteris paribus) comparative inefficiency. With such views as to the significance of the death-rate, it is obvious that we esteem it of very small value, as a sanitary test, and can therefore make little use of it in the inquiry in which we are engaged.

Death-rate.

Perfect healthiness in a hospital implies entire absence therefrom of additional risk to health or to life arising from special hospital conditions. Hospital unhealthiness is the sum of the effects of those deleterious agencies* which are apt to prevail in hospitals; these effects being either some mischievous influence over the natural progress of the cases admitted for treatment, the spread of contagious affections, the development of diseases in hospital, or the impairment of the health of resident officials.

Definition of hospital healthiness and unhealthiness.

We propose to discuss the nature and degree of these effects, and to consider how far their relative intensity in different institutions may be estimated. We shall, however, in the first instance limit the inquiry by excluding from discussion the relative progress of operation cases and of obstetrical cases; and by excluding also all reference to the so-called hospital diseases, pyæmia, phagedæna, erysipelas, and the like. We are led to adopt this course partly from motives of convenience, but in great measure because there is an essential difference between cases of internal diseases on the one hand, and, on the other hand, midwifery cases (in which a natural process is going on), and cases of open wounds (the result of violence or design).

The question as to the relative progress of cases admitted into hospitals is a very interesting and important question, and, we may add, a very wide, and complex, and difficult one. These very properties render it one of those questions on which hasty and superficial thinkers are apt to form and to express a strong and obstinate opinion. It is a very easy thing

Progress of cases in hospitals.

* The nature of these agencies—over-crowding, bad ventilation, bad drainage, want of cleanliness, class of cases admitted, and the like—is, so far as it has been deemed necessary, discussed in the chapters devoted to the regulations and construction of hospitals.

for any one to go through the wards of a hospital, and, comparing the patients mentally to so many delicate flowers, to fancy that here they droop for want of sun, that there they brighten under the influence of so many cubic feet of air, and, under the domination of such a fancy, to arrive at the strong conviction that patients acually do, like hothouse plants, die off in masses, under the blighting effects of slight departures from hygienic perfection. But those who are more cautious and more acute thinkers, and especially those who have also made a point of actually studying disease, will hesitate before subscribing to such views as these, and will demand the grounds on which such views are formed.

Progress of cases in hospitals.

There is, we suppose, very little doubt that diseases (quite apart from the supervention of any contagious affection, or of any complication traceable to hospital conditions,) are occasionally modified in their progress by hospital influences; that at one time convalescence is thereby protracted; that at another time death, instead of recovery, is the consequent result. Thus there are probably very few hospital physicians who have not seen (as they have had reason to believe) a case of bronchitis or of rheumatism aggravated by the draughts to which patients are so often exposed in hospital wards, and some could doubtless adduce instances in which such a misadventure has led to a fatal issue. Phthisis and pneumonia, heart disease and renal maladies, besides other affections which might be readily named, are all liable to be aggravated by the same cause, and at times, unquestionably, are thus aggravated. It will be observed that the series of examples we have selected for illustration are all of them cases in which the aggravation of disease has been supposed to be dependent upon one condition, which is a common condition (out of hospitals, as well as in them); a condition the competence of which to produce such effects is universally acknowledged, and a condition the influence of which is comparatively easy to recognise and (so to speak) to isolate. It is a condition too, we may add, which would probably by many be repudiated as a legitimate element of hospital unhealthiness. Nevertheless, we have here a tangible cause of aggravation of disease, a cause which is actually known (beyond all question) to produce such aggravation; yet the facts are not to be found in statistical records, and, indeed (though in isolated instances disastrous), form probably in the aggregate a comparatively unimportant item in hospital experience.

"But there are numerous other influences competent to affect the progress of cases in hospitals?" No doubt there are, and extreme causes of insalubrity, wherever they are found, necessarily lead to correspondingly extreme results. But the practical question is, not whether intensely unhealthy conditions (which in British hospitals have really no existence) are competent to produce intense mischievous effects,* but whether such attenuations of some of them as constitute the differences between different hospitals, or between a hospital and a perfectly salubrious private residence, are competent to produce minor but still appreciable effects of the like kind.

By way of answering this question, let us take for comparison a certain number of diseases, selected in some degree as representatives of classes of disease, and narrow the issue by making the influence of deleterious hospital agencies on them the special subjects of our argument. And first of pneumonia. Is the course of this disease capable of being visibly modified, not by sources of unhealthiness which may be imagined

* The often quoted cases of the unhealthiness of the hospitals at Scutari and of the old Hôtel Dieu, where patients were often placed five or six in a bed, are obviously therefore beside the question.

to exist, but by such sources of unhealthiness as do really exist to a greater or less degree in the civil hospitals of Great Britain? Does a larger proportion of pneumonia cases recover in this hospital than in that hospital? Or is it true that, of the cases which finally do well recovery is habitually a shorter process in the infirmary belonging to a rural town than it is in St. Bartholomew's? It might be thought, prima facie, that these questions were simple and easy of answer, and that all that is requisite to decide them would be to extract from the records of the several institutions chosen for comparison the cases of pneumonia that have been under treatment in them, and then to compare the respective results as regards duration of disease and proportion of deaths to recoveries. The question, however, is, as all practical men know, infinitely more difficult, and infinitely more complicated than it at first sight appears to be. Pneumonia is one of the most well-marked and well-defined diseases which physicians are called upon to treat; the symptoms are characteristic, and the disease itself generally well understood. But it occurs in a very great variety of forms. Now primary uncomplicated pneumonia, runs, like typhus fever and some other affections, a very definite course, and, although attended by symptoms of the gravest character, for the most part in London as doubtless in country hospitals terminates in recovery. But pneumonia, or, in other words, inflammation of the lungs, is a frequent complication of phthisis, of bronchitis, of heart disease, of albuminuria, of brain disease, and indeed, is apt to supervene towards the fatal close of a large variety of maladies (medical as well as surgical). And it need scarcely be added, that when it appears as the complication of an already dangerous, or it may be lethal disease, death is the frequent and often inevitable result. Now, unless all these varieties be accurately distinguished from one another, any comparison between the pneumonia cases recorded at one institution and those recorded at another institution becomes not only in a scientific point of view utterly worthless, but can only serve to mislead. We are satisfied, from our inquiries, that hospital statistics (except in certain instances, which, however, are too rare and partial for our purpose,) are absolutely valueless as evidence on the subject we are discussing; and they are valueless, not merely because they fail to make the necessary distinctions between the cases entered in the tables as cases of pneumonia, but because tabulation is conducted on no settled plan, and cases of the complicated form of the disease are registered indifferently, and by chance, under the head at one time of the primary affection, at another time of the pulmonary complication. But this is not all, for it is perfectly clear to us that diseases are in some institutions styled pneumonia which in other institutions would be carefully distinguished from pneumonia; and that the numbers of this disease become swollen in many instances by loosely including in it cases of bronchitis, of incipient phthisis, and of other pulmonary affections of an essentially different character. So far as we could ascertain, by inquiries made at the various institutions we visited, there seems to be no evidence of any appreciable difference as regards the progress and issue of this disease between large and small hospitals, or between town and country hospitals. One thing is certain, there is no shadow of evidence to show that pneumonia in country hospitals is more amenable to treatment, is of shorter duration, or of a less fatal character than it is in the hospitals of London or in the hospitals of other large towns.

Progress of cases in hospitals.

We will now take fever—typhus and typhoid. These again are well-marked diseases, and, moreover, would seem specially adapted for comparison, inasmuch as special hospitals, or special wards, are appro-

Progress of cases in hospitals.

priated for their reception in London, in some of the English country towns, in Scotland and in Ireland. But here again a difficulty meets us in limine. These diseases, although in London hospitals, regarded as perfectly distinct, and diagnosed with care, are in many country hospitals, and for the most part in those of Dublin, still confounded; and further, in published reports, a heading of "simple continued fever" is very generally still retained, and doubtless comprises in addition to cases of the above-named fevers a large variety of cases of imperfectly diagnosed maladies of different kinds. Now is there any reason, founded on fact, to believe that either typhus or typhoid fever is materially affected, as regards its progress and result, by any of those conditions which prevail in British hospitals? Considering the little value which we have good reason to attach generally to published records, we should esteem it an utter waste of time and space to bring together those of all the various institutions we have visited. We will, however, for illustration, adduce and compare a few examples. It appears that in 1862 the per-centage mortality of typhus cases treated in the London Fever Hospital was 20·8 (including in the estimate two patients brought dead to the hospital, and 32 who died within 24 hours of admission); and that the collective death-rate of cases treated in six of the general hospitals of London, during the first six months of the same year, was 23·32 per cent. The death-rate of typhoid cases treated in the London Fever Hospital was 13·5. In the report of the Glasgow Infirmary for the same year the deaths in typhus fever are estimated at 16·8 per cent. and the deaths in typhoid fever at 21·5. It might perhaps be hastily assumed from these figures that from some cause or other the atmosphere of the London hospitals is, compared with that of the Glasgow Infirmary, less favourable in its effect on typhus cases and more favourable in its effect on cases of typhoid. But on looking back into former records of the London Fever Hospital we find, that the mortality of typhoid was in three successive years 13·72, 26·7, and 20· per cent. respectively; and on the other hand, on referring to other reports of the Glasgow Infirmary, we perceive that in 1860 the mortality of typhus was 15·2 per cent., and that in 1861 the mortality of the same disease was 18·8. What is the lesson that we are taught by these facts? Is it that the Glasgow Infirmary is healthier in respect of one kind of fever, and the London Fever Hospital healthier in respect of another kind? Surely not; the differences presented in the death-rates of each institution during a series of successive years are no greater than the differences of their respective death-rates for any one year. And it is obvious, that these fluctuations are wholly (or in great measure) independent of any sanitary advantages which the one hospital enjoys above the other. From personal examination we should be disposed to assume that the London Fever Hospital ought generally to be a healthier institution than that of Glasgow; but while we detect nothing in the statistics which disproves this opinion we find nothing actually to confirm it.

The Dublin hospitals in which fever cases are treated are equally town hospitals with those of Glasgow and of London; but the reports which are published of them are very unsatisfactory documents, and were it not that the fever mortality of these hospitals appears to be low, would not have demanded any notice. There can be little doubt that many affections,* other than those which we are in the habit of regarding as typhus or typhoid, are included in these reports under the term fever, and tend to produce a diminished death-rate.

* Such as relapsing fever, of which the mortality is always low, and various inflammatory affections.

Progress of cases in hospitals.

The country towns of Scotland, and some of those of England, receive fever cases. In Arbroath, it is stated that 512 fever cases were admitted in the course of seven years ending in 1851, and that of these 51 or (10·0 per cent.) died, but that the mortality in 1862 amounted to 16·2 per cent. In the Derbyshire Hospital, during the same year, the fever mortality was 17·3 per cent. In the General Infirmary at Stafford the fever mortality in 1861 was 25 per cent., and in 1862 was 19·2 per cent.*

Now it is obvious when we come to consider all the discordant results above given, results which, taking into consideration the loose way in which the term fever is generally applied, seem quite as unfavourable in country hospitals as they are in those of towns, and it may be added quite as variable, that they do not very obviously lead to any definite conclusion. If, assuming all the facts on which the statistics are based to be accurate, we regard the tabulated results of all these various hospitals, in regard to fever, as themselves incontrovertible, it is possible, perhaps, that by exercise of considerable ingenuity some interesting deductions might be arrived at; but when it happens, as we know, that in most of the institutions the figures of which we have quoted, old notions in regard to fever still prevail, notions which are wholly different from those universally accepted in London, in Edinburgh, in Glasgow and some other cities; that in some instances typhus and typhoid are carefully distinguished as well at the bedside as in the reports; that in other instances they are wholly confounded, or regarded as different degrees of the same affection; that in other instances again (as practically is very common) numerous diseases, not necessarily of a specific nature, are conveniently grouped under the head of fever; and that further, in a large number of country hospitals, post-mortem examinations (which conduce so importantly to accuracy of diagnosis) are rarely if ever

* The death-rate of typhus fever, so far as has been ascertained, is very much dependent on the age of the patients affected, their sex, and the condition of system at the time of receiving the typhus poison. All this is very clearly shown by Dr. Murchison, who also shows that the general mortality of the disease is always high. In proof of the latter statement he points out that the average mortality of typhus patients in the London Fever Hospital for 14½ years was 20·89; that in 108 cases under the late Dr. Todd the mortality was 25 per cent.; that in 538 cases under Dr. W. Robertson in the Edinburgh Infirmary the mortality was 24·72 per cent.; that in 363 other cases admitted into the same institution the mortality was 22·3 per cent.; that during 11 years at the Glasgow Infirmary the mortality was 18 per cent., and during a subsequent period of five years 16·83; that of 1,366 cases under the care of Dr. Reid at Belfast the death-rate was 19 per cent. The same author shows that the death-rate of typhoid fever is almost identical with that of typhus, quoting the experience of the London Fever Hospital, of St. Thomas's, of Guy's, of King's, of the Glasgow Infirmary, and of French hospitals. But he also points out that when cases are classed under the general term "fever" the mortality is almost always considerably smaller, for the reasons which we have specified in the text. Thus the mortality from "fever" in the following institutions appears to have been as follows:—

	Cases.	Mortality, per Cent.
London Fever Hospital	9,146	16·31
St. Thomas's	1,107	10·
St. George's	911	11·3
Newcastle Fever Hospital	1,481	11·54
Nottingham General Hospital	845	12·78
Queen's Hospital, Birmingham	142	14·08
Bristol Royal Infirmary	1,890	9·47
Edinburgh Royal Infirmary	22,586	11·61
Glasgow Royal Infirmary	22,274	11·56
Aberdeen Royal Infirmary	9,191	9·27

made; it is clear that ingenious manipulations of figures which, having nominally the same signification, have been arrived at in such various ways, and represent such very different things, can only lead to utterly false conclusions. For ourselves we have no reason whatever to believe, there is to our minds no proof of any kind, that a case of typhus stands a better chance of recovering in the atmosphere of a country hospital than it does in that of a town hospital, or that typhoid, and we might add any other disease supposed to be infectious, is better circumstanced, as regards its simple progress, in one hospital than it is in another hospital.

Progress of cases in hospitals.

Let us now select phthisis. This is a disease which is common enough, and well marked enough for our purpose; and although it is by rule excluded from a large number of British hospitals, it is a disease which is never, and can never be, wholly excluded from any one of them. Now we have already pointed out that deaths from phthisis form a very large proportion of the deaths which occur among the larger and less exclusive institutions; while in a large number of the smaller hospitals this disease is, considering its frequency in all parts of the country, a rare cause of death. It will scarcely be assumed that the relatively higher proportion of phthisical deaths in the larger hospitals is a measure of their defective hygienic condition, especially when it is actually true that the majority of patients suffering from the disease referred to receive, for the most part, temporary benefit after their admission. We have pointed out that such patients are in the one class of hospital not only excluded by a rule pretty stringently enforced, but if accidentally admitted, and death becomes imminent, they are discharged, and the final issue does not appear in the hospital registers. We may add that the rule generally applies to "confirmed" phthisis, and that in such institutions incipient or suspected cases of the disease by no means unfrequently gain admission; and that hence there may appear in the reports of such institutions *a fair proportion* of cases of "phthisis" with perhaps not a single fatal case among them. It is obvious, therefore, that the statistics of phthisis given generally in hospital reports teach us nothing, absolutely nothing, with regard to the relative progress of the disease. They give us no information as to the effect of treatment, none as to the influence of hospital air, none as to the degree in which the progress and result of phthisis are impeded, modified, or hastened.

The question whether moist air or dry, an equable or a variable temperature, or this or that other condition of climate, are most suitable for consumptive patients, is not one on which we need here express an opinion. But that this disease, and diseases of the same class, are as common in the country as they are in large towns, and that their progress and termination are pretty nearly the same all over the kingdom, is a fact admitting, we fear, of little dispute. Certainly, it has happened that on putting the question to house surgeons and others connected with country hospitals, as to what form of disease specially prevailed in the neighbourhood, the answer has particularly pointed, in almost every instance, to what was supposed to be the peculiar prevalence of tuberculous and scrofulous complaints. We have reason to believe that wherever phthisis is a prevailing disease, its symptoms and progress are as nearly as possible the same, but we have no reason to believe that hospitals planted in localities where it prevails exercise any other than a beneficial influence over those cases of the disease which are received into them, still less to believe that owing to special hospital conditions phthisical patients do appreciably better or worse in one British hospital than in another British hospital.

We have thus, it will be observed, selected three well-marked forms of internal disease, in order to ascertain if, as regards any one of them, there is evidence of any kind to show that (independent of the supervention of other forms of disease acquired in hospital) their progress is affected injuriously by any of those conditions (actually existing in hospitals) which are assumed to be elements of unhealthiness. We have not aimed at ascertaining how far patients labouring under these diseases are liable to suffer from exposure to intense conditions of such forms of insalubrity as are known to be specially noxious to these diseases, but simply how far such patients suffer injury from a residence in hospitals now existing, and what if any difference there is in this respect between hospitals of various kinds; and we have arrived at the conclusion, as regards each form of disease, not that there is absolutely no injurious influence arising to it from the cause in question, but that there is absolutely no evidence to show that such an injurious influence exists, or acts at least in any appreciable degree.

Progress of cases in hospitals.

We had selected a few other diseases, and subjected them to a similar analysis, but the results, like those given above, were so thoroughly barren that it would be wholly useless to reproduce them here.

But to pass from medicine to surgery; many persons believe, or imagine, that wounds heal more rapidly and more kindly in the country than in town. It is perhaps allowable to say, that the facts in support of such opinions vary very much in number and in magnitude with the enthusiasm and the preconceptions of those who quote them; but no one imagines that a large jagged dirty wound in the country would heal more rapidly than a small incised clean cut in town; and as particulars in regard to the characters of wounds, and other particulars still more important, do not form the objects of hospital registration, no useful information as to the relative quickness of union of wounds can be gained from the register books of different hospitals. Similar observations apply with equal cogency to the cases of operation wounds and compound fractures. Simple fractures, however, present fewer complications, and hence would seem to admit of more useful comparison. We append, therefore, a table showing the average period of stay in hospital (the only test at our disposal) of 20 cases of fracture of the thigh, and the same number of cases of fracture of the leg*, in each of eight differently situated hospitals.

	Thigh.	Leg.
	Days in Hospital.	Days in Hospital.
St. Bartholomew's, London	69·9	40·1
St. George's London	41·6	29·9
Liverpool Southern Hospital	54·75	37·6
Bradford	44·7	34·3
Hereford	68·	38·
Portsmouth	55·5	35·5
Southampton	71·2	43·8
Plymouth	60·5	50·5

We have selected the period of union of simple fractures of the lower extremity for comparison, because these are accidents which for the most part occur to persons in their ordinary health, who are brought immediately to the hospital, and who remain there generally, in the

* Cases of fracture of the cervix femoris were excluded from this comparison; also all patients below 7 years of age and above 70. Fractures of the leg include fractures of one bone as well as of both bones. This was found necessary, from the language in which many hospital registers are drawn up.

Progress of cases in hospitals.

case of fracture of the femur, till the union is very far advanced, and in the case of fracture of the leg till it is sound enough to bear considerable force. These are terms which imply a good deal of latitude in the period of discharge from hospital; but a patient in a metropolitan hospital would appear from the figures above quoted to be in a condition justifying his discharge without manifest danger at least as soon as a patient in a country hospital.

The results are manifestly indecisive, and the variations which they present are in all probability purely accidental, dependent possibly to some extent on different methods of surgical treatment, but in no degree so far as can be seen on differences of locality, or other conditions affecting the healthiness of hospitals.

Before passing to another subject, we would wish to make a few observations in reference to the duration of the stay of patients in hospitals. This is a point to which in the course of the discussion just completed we have scarcely adverted, and yet it is a point to which certain sanitary writers would appeal with considerable confidence for the determination of the very question which has been before us. It is maintained by them, with a primâ facie show of reason, that, if in one hospital it takes on the average 20 days to treat a patient to a termination, and in another 30 days to accomplish a like result, cæteris paribus, the former institution must be regarded as the more salubrious one. And it may be admitted that if of two institutions it could be shown that all the cases of acute rheumatism (say) got well in the one in one-third less time than they did in the other, there must have been some important influence at work (something, for example, in the nature of the cases themselves, something in the medical treatment, or something in the atmosphere of the hospitals) leading to this difference of result. But those who attach importance to such figures are strangely ignorant of the causes on which their differences depend. Duration of stay in hospital is determined practically by such various circumstances, is so dependent on the caprice of patients themselves, and of their medical attendants, so dependent on the rules of hospitals, on the pressure of applicants for admission, and on the nature of the cases usually received, that, although possibly a point of interest to governors of hospitals, it loses all value as a test of salubrity, and becomes of little value as a test of anything. It may be stated generally, however, that patients remain longer in country than in town hospitals; that the stay of surgical patients exceeds in duration that of medical patients; and that acute affections, such as fevers, remain under treatment for a shorter time than other forms of medical diseases.* But in drawing inferences

* To illustrate the different lengths of sojourn in different hospitals, and under different circumstances, we append the following list:—

	Total.	Medical.	Surgical.	Fever.
St. Bartholomew's	36	28	44	—
St. George's	27·4	24·4	30·5	—
King's College	33	31	35	—
St. Mary's	30	26	35	—
Glasgow	31	29	37	27
Dumfries	31·4	27·3	35·5	—
Paisley	25·7	—	—	22·5
Whitworth, Richmond, and Hardwicke, Dublin	—	21·2	27·5	17

	Total.	Medical.	Surgical.	Fever.
Brighton	34	—	—	—
Taunton	50	—	—	—
Carlisle	40·7	—	—	—
Nottingham	38	—	—	—
Ipswich	53	—	—	—
Colchester	63	—	—	—
Chester	—	—	—	17·3
Shrewsbury	44·6	—	—	—
Norwich	42	44	40	—
Exeter	44·5	—	—	—
London Fever	—	—	—	25
Cork St., Dublin	—	—	—	18

from the comparative length of sojourn of patients in hospitals other sources of fallacy besides those which have been enumerated have to be guarded against. The practice to which we have before adverted of multiplying every patient who remains in hospital beyond a certain prescribed term, by the number of such terms he may fulfil, leads here, as in the case of the death-rate, to errors, which in some instances are very grave.

Spread of infectious fevers in hospitals.

The second point in our enumeration of the circumstances affecting the healthiness of hospitals is the spread of infectious diseases. There are certain affections, especially the eruptive fevers, which are capable of being conveyed from the infected to the healthy by the breath or other emanations or secretions of the body; and whenever, or wherever, (except under certain conditions) any one comes within their influence, he runs the risk of being infected by them; and quite independently of the purity or the impurity (in other respects) of the atmosphere which he breathes, and, so far as we know, quite independently of any general state of healthiness or unhealthiness in himself, may fall a victim to the disease the poison of which he has imbibed. All this is, of course, a mere truism, but it is important to enunciate it clearly, because it is apt to be assumed that the mere spread of affections of this kind in the wards of a hospital is a proof of the insalubrity of the wards in which it occurs. Such a spread of disease proves, of course, the presence of a poison, and that some one has come within its influence; it shows, what every one would admit, that the admission of an infectious case involves a risk; it raises the question as to the propriety of exposing any one to such a risk who comes to a hospital for cure. But unless the poison becomes so diffused, or so intensified by deficient ventilation or other hospital defects, as to *necessitate* its inhalation by other patients, the hospital in which such poison is present can scarcely be regarded as an unhealthy hospital, even though disease has spread in it. It is important further to call to mind that a very large number of the English country hospitals exclude by rule every kind of infectious disease, while most of those of London, Dublin, Scotland, and several of those in our county towns (those of Paris also) admit them, or some of them either among their general patients, or into special wards, or into separate buildings allotted to the reception of such cases. Now it is obvious at once that no comparison can be instituted between those hospitals which admit infectious diseases and those which exclude them. The former voluntarily incur a risk, and without exception, whether the hospital be in town, whether it be in country, or wherever it may be, the consequences of the risk occasionally manifest themselves. The latter, of set purpose, decline to expose themselves to any danger whatever, and many of them never do by any chance receive a case capable of communicating disease.

The possibility of contracting an infectious disease in a hospital depends almost entirely on the presence in the building of cases capable of imparting it, but the degree in which such a disease may spread will doubtless depend very much on the "so-called" sanitary condition of the hospital, its condition, that is to say, as regards ventilation, number of patients in proportion to space, cleanliness, and so on. In those institutions in which typhus is concentrated we should naturally expect to find it spreading, and hence in the large fever institutions of London, Glasgow, and Dublin we are not surprised to learn that patients suffering from other diseases, nurses and medical officers, all are liable, unless protected by a previous

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attack, to take typhus.* In the general hospitals of large towns, again, in which such cases are admitted, a similar spread is apt to occur; thus DR. Murchison points out that during the first six months of 1862 (while an epidemic of typhus was raging in London) 272 cases of this disease were admitted into six of the general hospitals of London, viz., St. Bartholomew's, Guy's, St. Thomas's, Middlesex, St. Mary's, and the German Hospital, and that these communicated the fever to 71 persons (nurses and patients), of whom 21 died.† So, quite recently, in the Manchester Royal Infirmary, where fever cases are admitted into a separate part of the building, the resident physician caught typhus, and died of it, and one of the physicians, the head nurse, and two other persons, also contracted the disease. But what occurs in large towns occurs also in purely country hospitals when similar cases are received into them. Thus, lately, in the Chester Infirmary, the house surgeon and the porter both died from typhus, probably imparted to them by patients in the house. In the Dundee Infirmary two resident medical officers in succession have died of fever, and several patients have been attacked. In the Paisley Infirmary the house surgeon and one of the nurses lately took the same disease. In the hospital at Montrose, during the year 1855, a large number of cases of fever and of small-pox were admitted, and the assistant surgeon, the matron, the fever-nurse, her two assistants, and the cook, all contracted fever, and one had it severely. Patients, moreover, recovering from typhus, took small-pox, and conversely. On other occasions since 1855 these diseases have spread in the same institution.

But although typhus fever undoubtedly spreads very readily, both to nurses, to medical men, and to pupils, and even also to patients who come closely into contact with those suffering from it, it seems quite well established in regard to this disease that in a well-ventilated and not over-crowded hospital the poison, even when many typhus patients

* In the London Fever Hospital, in the year 1862, 43 persons caught typhus, of whom 28 were nurses. In the fever house of the Glasgow Infirmary, three nurses and one of the physician's assistants have been attacked with typhus during the last year or two. Typhus has also frequently spread in the Edinburgh Royal Infirmary.

† Dr. Murchison points out that during the same period 1,080 typhus cases were admitted into the Fever Hospital, and communicated the disease to 27 persons. In comparing the experience of different metropolitan hospitals in regard to the spread of typhus in them, and especially in comparing the experience of the London Fever Hospital (as Dr. Murchison has done) with that of the general hospitals, it must not be forgotten that the occurrences alluded to took place during a severe epidemic of typhus, that many of the 71 cases attacked in the general hospitals were nurses, and that in regard to some of the cases there is no proof that the patients caught the disease from other patients in the hospitals. If we add another month to the experience which Dr. Murchison quotes of St. Thomas's, we find that more than 92 patients were admitted with typhus, and that 14 persons caught it in the hospital, viz., 10 nurses, of whom none died, and 4 patients, of whom 2 died. Again, Dr. Murchison's list of 71 cases contracted in hospitals includes 5 cases of patients at the Middlesex, who, it is extremely probable, did not contract it from other patients, and several at Guy's, who also probably did not contract it from patients. For further details in regard to these cases see page 542. We may add, that during the year 1863, 33 cases of typhus were admitted into Guy's, and that no instance of its spreading occurred. In treating of these cases of fever breaking out in hospitals, much caution is necessary in ascertaining the circumstances of each case. Thus, in St. George's Hospital lately a patient died of typhus fever, caught in the ward from another patient. But if this circumstance were used in any argument against the plan pursued at St George's, of treating typhus fever in the general wards, it would be misapplied; for it would prove, on inquiry, that the occurrence took place in one of the surgical wards, and that the man who conveyed the infection was taken in for another disease. This is clearly an accident which might have happened, and constantly does happen, in dwelling houses of all kinds.

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are accumulated, extends to a very short distance indeed around each individual; so that in such an institution, unless the poison be conveyed carelessly by fomites, or by the attendants, there is no reason why the general patients should incur any risk whatever of contracting the disease. It is very rare for typhus to spread from one patient to another occupying a contiguous bed; such an occurrence is rare (if not unknown) even in the Fever Hospital, and we are not aware that such an event has occurred at either St. George's or St. Thomas's Hospital. As regards the latter institution it is an interesting fact that, since it has occupied its temporary site (about 15 months), it has had admitted into it at least 20 or 30 cases of typhus, but that, although one nurse during this period has contracted the disease and died of it, no patient has caught it, notwithstanding that the wards contain 84 beds apiece, and that many of the beds are placed back to back touching one another. Dr. Peacock records, however, that in the Edinburgh Infirmary (scarcely a model hospital) typhus did spread to the adjoining beds when an attempt was made to admit typhus cases in small numbers into the general wards.

The poisons of scarlet fever and of small-pox are unquestionably much more diffusible and unmanageable than that of typhus; and the spread of these diseases in hospitals, after the admission of cases already suffering from them, is relatively both more frequent and more extensive than that of typhus. Yet, even as regards these diseases, infection in a well-ordered hospital is doubtless more frequently conveyed by nurses and other attendants, or by injudicious acts on the part of patients themselves, than by any other means. Examples of the spread of small-pox are numerous; thus in St. George's in 1863, a case of small-pox accidentally admitted infected about 20 other persons; in the Westminster Hospital five cases of the same disease recently broke out in the wards; and in St. Mary's, in the early part of 1863, about a dozen cases originated in the hospital; the experience of other London hospitals is not very different, and similar occurrences have been noted in the infirmaries of Glasgow, Manchester, Dumfries, Montrose, Perth, Derby, and of other country towns.* Scarlet fever, which is more generally admitted into English hospitals than small-pox, is known also to spread at times in all hospitals into which it is received.

That diseases so infectious as typhus, small-pox, and scarlet fever are known to be should readily disseminate themselves was to have been expected; but we have met with evidence to show that a malady so little contagious as typhoid fever generally seems to be also occasionally spreads. One of the most interesting examples of this fact is furnished, not by a town hospital, but by one that in most respects is a purely country hospital; viz., the Bath United Hospital. It appears that in the spring of 1862 a child was admitted with typhoid fever, and died of it; a girl in the same ward suffering from epilepsy was attacked about the time of the death just mentioned, and died in 11 days with perforation of the bowel; a convalescent patient also in a surgical ward was attacked at the same time and died; the nurse in the ward in which the disease first occurred took the same disease and recovered, and a nurse in the back house (but occupying the same dormitory with her colleague) likewise caught typhoid fever and recovered. Typhoid was then common in the town; and two or three other cases of the disease were admitted into the

* Almost all the cases of small-pox originating in hospitals are of a modified and mild type. Deaths are excessively rare.

hospital about the same time. Again, not very long since, two nurses in the Royal Free Hospital took typhoid fever and died of it, having apparently caught the disease from patients under treatment. Almost the same thing also occurred lately at Canterbury; but that such an event must be excessively rare is shown by the experience of the London Fever Hospital and of nearly all the general hospitals of London. In the former institution we do not learn that during any of the five years, the experience of which we have quoted, a single patient admitted for any other disease has contracted typhoid.* Nor as regards the other institutions are we acquainted with any well authenticated instances of such spread, excepting in the case above quoted of the Royal Free Hospital.

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Whatever mystery there may be as to the nature of the poisons of really infectious diseases, and the modes in which these poisons act, there is none whatever as to the fact that these poisons produce specific results, and that these results are of a very striking and unmistakeable character. Since, therefore, these results are measurable, and since they are at the same time certainly very important, it is worth while to consider briefly what their effect on death-rates really amounts to. In 1862, 43 persons in the London Fever Hospital had the disease communicated to them in the hospital, and of these 9 died. The total number of patients treated to a termination during the year was 2,656, the total number of deaths (including the 9 just mentioned) was 472, and the death-rate, calculated from these total numbers, amounted to 17·77. Now if these 9 deaths had not occurred, the death-rate would scarcely havebeen changed; it would have been 17·43 instead of 17·77, a difference of ·34 only. The effect on the death-rates of the general London hospitals due to the two or three fever deaths (dependent on hospital contagion) which occurred in each of them would be still smaller, in fact scarcely appreciable.† It is curious to observe that the mortuary tables, which are influenced seriously by a large number of conditions totally unconnected with health, are scarcely affected by exceptional circumstances connected with the spread of disease which are great enough to rivet attention and create alarm in the institutions in which they occur.

Development of medical diseases in hospitals.

The third point which we have indicated has reference to the development of disease in hospitals. In a general way people talk of the healthiness and unhealthiness of districts, according to some theoretical notions as to what physical conditions are essential to constitute salubrity, or according to some real or fancied influence which localities peculiarly circumstanced have exerted upon themselves. Thus, they talk of the good or ill effects of an elevated site, a bracing atmosphere, a gravelly soil, a moist and relaxing climate, and so on, without probably having any positive proof that one condition is really healthier than another. It is not improbable that certain peculiarities of climate suit one constitution better than they do another constitution; but it does not necessarily follow that that which suits A best is more salubrious than that which suits B best; or that that which is found most invigorating for an elderly person should be healthier than that which is found most invigorating for a child. But apart from unsubstantial differences of this kind, in regard to which there is so

* A nurse took typhoid fever in 1862.

† In St. Thomas's, during the same year, 2,374 patients were treated to a termination, and 232 (or 9·77 per cent.) died. Two patients died of typhus contracted in the hospital; the exclusion of these deaths diminishes the death-rate to 9·68.

much room for the exercise of the imagination, there are real tangible effects which certain localities exercise on the system rendering these localities in a greater or less degree absolutely insalubrious. Thus the poison of yellow fever is endemic here, the poison of ague prevails there; goitre is the product of one locality, renal calculus the product of another; parasitic affections of various kinds characterize certain regions of the earth; and typhoid fever, diphtheria, and many other maladies belong more or less to the same category.

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Now to apply this to hospitals: there is no doubt that a great many crude and wholly unproved notions prevail with regard to the connection between the healthiness of these institutions and the site they occupy; and no doubt medical men are to be met with who will assert, that in some particular hospital wounds heal more slowly than they do in some other hospital, or that rheumatic cases do less favourably, or that certain other acute or chronic maladies progress less satisfactorily in this institution than they do in that institution. On the truth of such assertions as these, which are almost wholly beyond the reach of proof or disproof, people necessarily form different opinions. We protest, however, against their unqualified acceptance.*

But if we leave these mere matters of opinion for the more distinct evidences of unhealthiness furnished by the development of special diseases, what do we find as regards those maladies which, in England, render localities insalubrious? Of course it would be absurd to expect to find that the causes productive of bronchocle and of renal calculus, even if hospitals shared them with the surrounding neighbourhoods, operated in any visible degree on patients whose sojourn in hospital is limited to a period of a month or two only. But as regards more acute forms of disease, such as typhoid fever and diphtheria, we might very reasonably expect to recognize manifestations of them as indicative of special kinds of unhealthiness. Two or three years ago, when diphtheria was common in London, a case or two of the disease broke out, apparently independent of any contagion, in one of the surgical wards of St. Thomas's Hospital. But this is almost if not quite a singular instance in the experience of the hospital, and if it is to be regarded as a sign of insalubrity, the insalubrity was of very limited duration. A solitary instance of the like kind has occurred during the last three years in the Hospital for Sick Children. There is no doubt, however, that diphtheria breaks out very rarely in hospitals. Typhoid fever, again, is evidently rare as a hospital disease. A good many cases might be quoted in which death has been assigned to the supervention of typhoid fever in hospital; but as regards the majority of them, the term typhoid has evidently been used in its "non-specific" sense, to indicate "typhoid symptoms" or the "typhoid state." Among the best authenticated instances of the outbreak of typhoid fever in hospitals we may enumerate: (1), the Charing Cross Hospital (here, during 1862, seven or eight cases of typhoid broke out about the same time, but the patients suffering from it were believed to have contracted the disease prior to admission); (2), St. Mary's Hospital (here also four cases of typhoid fever are stated to have originated spontaneously); (3), the Dreadnought Hospital Ship (between November 1861 and January 1862 three petty officers took typhoid

* In the old hospital at Bradford, which was admitted to be unhealthy, we were informed that the health of the inmates was never very good; some being always laid up with diarrhœa, dyspepsia, sore throat, &c. Still no serious disease had ever broken out, and no death had occurred. "Hospital sore throat" is an affection familiar enough to our London students, but it appears to depend more upon exhausting and unhealthy labour than on influences peculiar to the hospital itself.

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ever, and died, and the boatswain's wife and some others were also attacked, but recovered); (4), the Salisbury Infirmary (a case of the same disease seems to have originated in this hospital); (5), the Winchester Hospital, where there is reason to believe typhoid fever has been a not uncommon visitant; and (6), the Exeter Hospital, where two inmates became not long ago affected with the disease.

Whilst on this subject, we can scarcely do otherwise than refer to an outbreak of typhus which occurred in 1862 in one of the new wards of Guy's Hospital. There were at the time in the ward a case of glanders and one of putrid sore throat, which rendered the ward offensive, and there had been in it three weeks previously a mild case of typhus. In the first instance, two patients were attacked almost simultaneously with typhus; both were in the hospital for other diseases, and one (suffering from diabetes) had been an inmate for a month. Five other persons were subsequently attacked, and two deaths resulted. The outbreak was considered by the medical staff to be dependent on a defective sanitary condition of the ward, arising from imperfect ventilation and the presence of the two offensive cases which have been mentioned. During the same year several cases of typhus broke out in the Middlesex Hospital in wards into which no typhus cases had been admitted. But it must be recollected that both these outbreaks occurred during the prevalence in London of a very severe typhus epidemic.

It would not be difficult to quote cases in which small-pox and scarlet fever have broken out in hospitals without the source of contagion being traceable; but it is needless to do so, because it would require proof far more complete than any we could adduce to convince any one that such diseases had originated spontaneously; indeed we do not for a moment suppose that they have thus originated. We may add, that during the cholera epidemic of 1849 several cases of this disease broke out spontaneously in the Hull Infirmary, although cholera cases were refused admission.

From all that we have seen and learnt, we conclude that diseases, such as those which have been above enumerated, break out in hospitals far less frequently than they do in private houses, and especially than they do in the dwellings of the labouring poor, a circumstance not to be wondered at when we compare the relative condition of even an ill-constructed, ill-ordered hospital with that of a poor man's residence in matters of drainage, cleanliness, ventilation, and cubic capacity.

Health of nurses, &c.

It is natural to suppose that the health of residents, especially of nurses, should form an important item in estimating hospital salubrity. Miss Nightingale, with the assistance of Dr. Farr, has published a series of tables* in which the mortality among the nurses and sisters

* The table from which we specially quote in the text is Miss Nightingale's second table.

"Table of the Mortality of Matrons, Sisters, and Nurses at different ages, in fifteen London hospitals, compared with the mortality of the female population of London:"

Ages.	Matrons, Sisters, and Nurses (1848 to 1857).		Female Population of London.	
	Annual Rate of Mortality to 1,000 living at the respective Ages.			
	By all returned Diseases.	By Zymotic Diseases.	By Zymotic Diseases (1848-1857).	By all returned Diseases (1848-1854).
23 to 35	15·39	9·63	2·19	9·92
35 to 45	16·89	10·94	2·73	14·65
45 to 55	17·80	11·87	3·17	20·36
55 to 65	46·36	14·26	4·94	38·02

of 15 London hospitals is compared with the mortality (at the same ages) of the general female population of London. The tables of course are necessarily very fallacious, both on account of the small numbers available for comparison on the one side (nurses), and the inaccuracy with regard to the recorded causes of death on the other side (public). It would appear from these tables that in nurses from 25 to 35 years of age, and again in nurses from 55 to 65, the mortality is considerably greater than it is in the general female population at the same ages, whereas between 35 and 55 the difference of mortality is slight, but on the whole perhaps somewhat favourable to the nurses. It would further appear that the mortality due to fever and cholera has been considerably greater at all ages among the nurses than among other females. But it will scarcely be assumed that nursing between the ages of 35 and 55 is a healthy occupation; we should rather (notwithstanding the figures) incline to believe the reverse, and that the figures themselves, owing to the small numbers involved, are deceptive. But if this is the case as regards this particular column of the table, we can scarcely suppose that the column professing to give the death-rate of zymotic diseases is much more trustworthy. On the whole, the results derived from the table are unimportant, and scarcely confirm the opinion which, nevertheless, is doubtless a correct opinion, that nursing (especially in hospitals where infectious diseases are admitted) is attended with risk, and that nurses, in greater proportion than any other class of persons, contract these affections, and not unfrequently fall victims to them. Indeed the experience of the London Fever Hospital, of Guy's, of St. Thomas's, and of other metropolitan hospitals, of the hospitals of Glasgow and Dublin, and of country infirmaries admitting these affections, proves the fact beyond a doubt. But the same thing would follow even if nursing were performed in the open air on the summit of a mountain. That it is our duty to diminish the risk as much as possible cannot be denied; but where contagion is conveyed by the breath, and nursing involves the breathing of patients' exhalations, disease must necessarily be occasionally contracted by nurses. Cæteris paribus, it may be admitted that in proportion to the relative accumulation of cases of infectious diseases will be the danger of their spreading; but we are not aware that the danger incurred by a nurse in a small hospital is necessarily less than that incurred by a nurse in a large hospital. The experience in the hospital at Montrose and in that at Greenock is at least equally unfavourable in this particular with the experience at the London hospitals.

Health of nurses, &c.

But nurses are doubtless liable to ill-health from other conditions than those depending on the presence of contagious diseases. Hospital sore-throat, as it is termed, and other forms of deterioration of health, are not unfrequently complained of; but we have not been able to ascertain with any approach to completeness or uniformity the degree in which such affections are present or absent in the different hospitals we have visited. There is no doubt, however, that the duties of nurses in large hospitals, and in small hospitals receiving a large proportion of serious cases, are very laborious and exhausting; that nurses have often little sleep and little opportunity for exercise in the open air; further, that in some institutions the nurses' dormitories are wholly inadequate and inappropriate for the purposes to which they are applied. It is not to be wondered at, therefore, that, quite independently even of special hospital influences, nurses should be apt to fall into ill-health; it is more wonderful in fact that their health is so good as it is.

But it is quite obvious that much of any unhealthiness they may as a class exhibit above that of the general population must be attributed to other conditions than those specially affecting the salubrity of hospitals, and that hence such excess of unhealthiness, assuming its actual existence, must not be taken as a measure of the sanitary condition of hospitals.

Occurrence of "so-called" hospital diseases.

All surgeons attached to large metropolitan hospitals are aware that their operation-cases are apt occasionally to be carried off by the supervention of erysipelas, pyæmia, or hospital gangrene, or some allied unhealthy form of inflammation. They know well that they may go weeks, months, occasionally even years, without losing a patient from any of the above causes; that occasionally an isolated case may occur; and that now and then some one or other of these secondary diseases prevails for a time endemically, attacking operation case after operation case, until the ward or the wards which have been the seat of the outbreak have been emptied and thoroughly ventilated and cleansed; and that even after apparently ample precautions of this kind have been carried into effect, the re-occupation of the emptied beds may be the signal for a renewed manifestation of the disease. It is generally considered, in Great Britain at least, that the occurrence of these secondary forms of disease, and especially their frequent recurrence, or their prevalence in an endemic form, is an indication of unhealthiness in the hospital, or in that part of the hospital wherein they manifest themselves. And there can be little doubt that wounds, arising from accident or design, are really a very delicate test of certain insalubrious conditions of atmosphere, which, so far as we know, are wholly or almost wholly inoperative upon individuals suffering from internal diseases. There can be little doubt too (indeed there is abundant evidence to prove) that the development and spread of these diseases are intimately associated with defective hygienic conditions, such as over-crowding, bad ventilation, bad drainage, want of cleanliness, and defective water-closet arrangements. But there can be equally little doubt that these sanitary defects are not the sole cause, probably even not the immediate cause, of the outbreak of these unfortunate complications; for it seems to be a tolerably well-ascertained fact that in places where they become endemic there must be (not merely to allow of their spreading, but in order to beget them,) an accumulation of open sores, producing what is termed a "traumatic atmosphere."

But in considering the question of the causation of these affections, there are two or three important points which must not be lost sight of: 1st. There is good reason to suppose that erysipelas and phagedæna, possibly even pyæmia*, are sometimes endemic in a locality, in dependence on conditions as little obvious as those which regulate the appearance of diphtheria and some other affections, and we have been informed in many instances, where these diseases have prevailed in a hospital, that they have prevailed also to a greater or less extent in the district or town in which the hospital was situated†; 2nd. There are certain

* We were told by one of the most eminent surgeons in Paris, that he believed pyæmia to be a disease endemic in some localities and totally absent from others, and he named a large city in France (Rouen) where he believed that no case of pyæmia had ever been known, while in Paris he thought the great prevalence of the disease,—a prevalence, be it remembered, which is noticed in private practice as well as in hospitals,—is due to climatic causes. We were not able to test this statement with respect to Rouen. With respect to Paris we have expressed our opinion elsewhere.

† Such has been the experience at St. George's Hospital, and the hospitals at Birmingham, Bath, Belfast, and Taunton.

forms of disease and injury, especially those affecting bones, in which pyæmia, independently, so far as we know, of atmospheric or other sources of ill-health, is apt to ensue; 3rd. Erysipelas (especially erysipelas of the face and head) is by no means infrequently (like a sore-throat, an attack of bronchitis or of rheumatism,) the direct consequence of exposure to draughts or alternations of temperature; 4th. Any of these secondary affections may certainly arise also under special conditions of personal health. In persons who have been reduced by privation, and in those who have indulged in a long course of intemperance, it is quite well known that gangrene, diffuse cellular inflammation, and the like, are specially prone to ensue upon even slight injuries.

Hospital diseases.

Now such facts as these have an important bearing on the question of the healthiness of hospitals, and throw a considerable impediment in the way of arriving at a definite conclusion with regard to it; for it is obvious from them that the mere presence of pyæmia, phagedæna and erysipelas in a hospital, that their supervention even in cases under treatment in a hospital, by no means necessarily imply hospital unhealthiness; the attack of phagedæna may have been determined by the constitutional condition of the patient who is the subject of it; the occurrence of pyæmia may have been the natural sequence of the particular disease under which the patient was labouring; or the attack of erysipelas may have supervened on exposure to the draughts which are so common in our hospital wards. These are not loose statements. They are such as medical men generally will acknowledge to be true, and such as can readily be confirmed by evidence.

There is a further point, and one of great importance, which must not be overlooked in comparing the results of hospitals of different sizes, viz. (if the expression may be used) their relative intensity of experience. To illustrate our meaning, the Essex and Colchester Hospital has 90 beds, and admits about 260 cases in the year; St. Bartholomew's has 650 beds, and admits about 5,400 cases in the year. Now in the latter institution there is a vast experience concentrated into one year, and all circumstances, such as outbreaks of pyæmia and spread of fevers, which seem to indicate unhealthiness, stand prominently forth; but in the former institution, even assuming the cases treated in it to be of equal importance with those treated in St. Bartholomew's, 20 years would have to elapse before its experience would be equal to that of one year's experience at St. Bartholomew's. In 20 years of unrecorded experience how many facts are likely to be either exaggerated by the memory, or distorted, or utterly forgotten! But what is true of St. Bartholomew's and of the hospital at Colchester is true also in various degrees of numerous other town and country hospitals; and in the difficulty or impossibility there often is of acquiring "back" information, with regard to the latter institutions especially, comparisons have to be made on very unequal terms, and are thus deprived of much of their value and significance.

It would no doubt be most satisfactory to discuss separately the origin, the spread, and the nature of the various diseases to which the unfortunate results of surgical operations are so often due; but such evidence in relation to them as we possess is of so mixed a character that practically such a separation becomes impossible.

That erysipelas, pyæmia, and phagedæna occur in the hospitals of London and of other large cities is so well known a fact as scarcely to need that any evidence in support of it should be adduced here. The fact as regards London is established, but the relative degree in which these affections prevail in different London hospitals is by no means easy to discover. Now and then, when a serious outbreak occurs, or

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some peculiar form of one of them (phagedæna for example) shows itself, as it did two or three years ago in St. Bartholomew's and in University College Hospital, intelligence of the occurrence finds its way into the medical periodicals. Several hospitals have recently published annual reports in which information on this head is afforded; other hospitals keep good records both of cases and of post-mortem examinations, and a diligent search among them would certainly give valuable information. There are again other hospitals which keep no records of any scientific value at all. But, indeed, it may be admitted that generally (with the exception of the recorded facts arising out of post-mortem examinations) the history of outbreaks of these diseases is to be sought only in the memory of those who have witnessed them. Phagedæna does not appear to be common in any of the hospitals; but at times, as lately at St. George's Hospital, it becomes endemic. Erysipelas occasionally spreads in wards, and sometimes, but not frequently, proves fatal to surgical operations. Pyæmia is certainly the most commonly fatal of secondary surgical affections. Sporadic cases occur from time to time in all hospitals, and occasionally there is an outbreak either in a hospital, or a ward of a hospital, which only the most ample measures of cleanliness are competent to arrest. Such an incident occurred some few years ago in one of the wards of St. Thomas's Hospital, and the ward had to be repeatedly emptied and cleansed before its salubrity became restored.

In the hospitals of Paris the occurrence of these secondary diseases seems far more common than in our own. Operations, it is well known, progress far less favourably there,* in consequence of the liability to these affections, than they do in the hospitals of our own capital; and so generally is this fact admitted, so accordant is it with common experience, that many capital operations which are performed in London hospitals with comparative safety have been abandoned in Paris on account of the grave risk attendant on their performance, or have been scarcely attempted. Yet, though comparatively few important operations are performed there, these secondary affections still prevail to a very alarming extent.

In the hospitals of large manufacturing towns again the same affections are known to be not unfrequent. In the infirmaries of Edinburgh, of Glasgow, of Belfast, of Manchester, of Liverpool, of Newcastle, of Sheffield, and of Birmingham, they are met with, interfering more or less seriously with the success of operations. Indeed, the reports of the Glasgow Infirmary, which are very complete, show a surgical experience at least equal to that of the large London hospitals, and a very considerable mortality from pyæmia.

When, however, we come to the hospitals of smaller towns our information becomes less definite, partly because records of their experience are very imperfectly or not at all kept, and partly because, in these hospitals, cases of grave operation and of serious accident (which are specially affected by such maladies) are few and far between. But that such institutions cannot be regarded as free from liability to erysipelas, pyæmia, and phagedæna is shown by numerous significant instances.

In almost all the cases where definite outbreaks have occurred in country hospitals they have been traced (rightly or wrongly) to some special influence, such as imperfect ventilation, want of cleanliness, overcrowding, or unwonted accumulation of serious cases. It will be worth

* See list of Amputations in Paris hospitals, page 737.

while to bring together the information we have received in regard to several of these institutions.

Hospital diseases.

At the York County Hospital, a small well-constructed country institution in which few important operations are performed, pyæmia, and more especially erysipelas became during a series of years so common and so serious in their effects that at length patients were actually allowed to die unoperated upon rather than to incur (while there was yet a chance of life) the risk of almost certain death which an operation entailed. This condition of things co-existed with a close and offensive state of the wards dependent on the sole use of artificial modes of warming and ventilation. The evil became ultimately so manifest that in 1859 the artificial system was discontinued; windows which had been formerly kept closed were henceforward habitually opened; open fire-places, of which there had been none, were provided; the hospital was temporarily emptied, and was thoroughly cleansed; and since then the place has continued perfectly healthy.

In the Radcliffe Infirmary, Oxford, for the most part an old institution in which few acute medical or surgical cases are admitted, there occurred some years ago a succession of outbreaks of erysipelas, which became so serious that circulars were distributed among subscribers begging them not to send patients to the hospital. These outbreaks were traced to a combination of causes; 1st, to want of cleanliness in the beds (the fault, it is said, of the matron); 2nd, to interference with ventilation owing to the presence of bulkheads between the beds; and 3rd, to bad drainage. These defects were remedied about 10 years ago, and erysipelas has ever since ceased to be a cause of grave anxiety.

The Hants County Hospital, a purely country hospital, with a very low annual mortality, has been regarded by nearly every one who has had to do with it as a very unhealthy building; an outbreak of fever has occurred in it on more than one occasion (although fever cases are not admitted), and erysipelas would seem to have been endemic for a series of years. In the year ending June 1861, 25 cases of erysipelas originated in the house, and nine deaths ensued. The probable causes of this unhealthiness were faulty construction, combined with bad ventilation, and bad drainage. The latter has been much improved since the last-named outbreak of erysipelas.

In the Salop Infirmary, another country hospital, with a low mortality, but with (for such an institution) a more than average number of surgical operations, erysipelas prevailed in the wards between March and June of the present year (1863); 12 or 15 cases of the disease occurred, and one death. Coincident with the prevalence of erysipelas was a good deal of phagedæna and a death from pyæmia. A second death from pyæmia occurred later in the year. The supposed cause of unhealthiness was defective drainage.

The Plymouth Hospital again, a hospital with a small number of beds, and admitting a class of cases which are not of a very acute or serious character, seems to labour under a considerable prevalence of hospital affections; erysipelas frequently appears and spreads, pyæmia is common, and hospital gangrene at times prevails to such an extent that it has been found necessary almost to empty the wards. The hospital itself is not well constructed for ventilation; it has been, until perhaps lately, badly drained, the water-closets are ill situated, and the beds too close to one another.

In the hospital at Taunton, a small and in many respects not ill-constructed hospital, with a class of patients such as one expects to find in small country towns, an outbreak of erysipelas took place in the

year 1861; it lasted for about six months, and during this time 46 cases of erysipelas occurred in the house, all the surgical wards being invaded by the disease. Nearly all operation cases were attacked, and two died. It was attributed to changes that had recently been made in some of the wards interfering with their ventilation. But erysipelas was said to be prevalent in the town at the same time.

In the hospital at Colchester,—the very type of a rural hospital,—phagedæna in 1862 attacked 4 operation cases in succession.*

Hospital diseases.

But we may quote the experience of hospitals which stand on sites of selected salubrity—the Sussex County Hospital at Brighton and the Margate Infirmary. In the former, where undoubtedly a comparatively large number of operations are performed, pyæmia and erysipelas are said to be relatively as common as in London Hospitals. And in the latter, where scrofulous and such like cases only are admitted, where the great majority of patients are out of bed and not even confined to their rooms, where no infectious cases and none of accident are admitted, and where the death-rate is excessively small, surgical operations are nevertheless not infrequently followed by erysipelas and pyæmia.

We may yet quote an example or two from our experience of country hospitals, to show the effect which the unwonted accumulation of severe accident cases has over the development of hospital affections. The Chester Infirmary, it need scarcely be said, is a thoroughly country hospital; it receives a moderate number of severe cases, and enjoys a low mortality. But Dr. Peacock, who some considerable time since was for several years house surgeon to the hospital, tells us that for the first two and a half or three years of his tenure of office serious accidents and injuries were admitted only occasionally, the wards were never over-crowded, and erysipelas and other hospital diseases never occurred in the cases under treatment. During the last 12 or 18 months of his time, however, the Chester and Crewe and the Chester and Birkenhead railways were in course of construction, and many serious accidents from them were admitted into the infirmary, so that the wards devoted to their reception were often overcrowded. The wards became in consequence very unhealthy, erysipelas constantly occurred in them, and they had to be temporarily closed, and thoroughly cleansed. It may be added that the Chester Infirmary presented then and still presents many faults of construction. The experience of the Cumberland Infirmary at Carlisle is very similar. No cases of pyæmia occurred in the house for several years after its foundation in 1841, but while railways were being made in the neighbourhood serious accidents became numerous, and the mortality from operations was distinctly increased. Erysipelas and pyæmia have prevailed on more than one occasion, but not for the last three or four

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*. To the above list may be added:—

The hospital at Bath, where there has been latterly a good deal of erysipelas;

The old hospital at Bury, where two or three years ago erysipelas became so common that it was impossible at length to perform surgical operations;

The hospital at Lincoln, where, about four years ago, a severe outbreak of erysipelas, pyæmia, and phagedæna occurred;

The hospital at Reading, where, in consequence of neglect of cleanliness, about two years ago, an outbreak of erysipelas showed itself, and 28 patients were attacked; none died;

The Worcester Infirmary, where, about 10 years ago, erysipelas and phagedæna prevailed.

We might specify others; but in fact nearly every hospital in the kingdom has had some experience of these affections. As bearing on this subject, we may refer to the table of deaths from pyæmia, given on a subsequent page.

years. The hospital occupies an admirable site, but its ventilation, owing to structural peculiarities, is evidently liable to be defective.*

The experience of country hospitals would seem, from the above examples, to accord very much with that of town hospitals, allowing of course for the different intensity of practice which is met with in the two classes of institution and for their difference of size. The experience of the York Hospital seems to prove quite conclusively that want of proper ventilation is ample cause for an extreme degree (as regards surgical patients at least) of hospital unhealthiness in a building otherwise admirably suited for hospital purposes. That like results may arise, from defective drainage and defective hospital construction, in the hospital of a purely agricultural district, seems to be the lesson taught by the records of the Winchester Hospital, and we might add by the records of the Salisbury and even of the Colchester Hospital. The ill effects, specially, of filthiness of beds, is evidenced in the history of the Radcliffe Infirmary. That admirable salubrity of external atmosphere is insufficient to counteract the effect of poisons generated in a hospital, or to prevent the generation of such poisons, is shown by the hospitals at Brighton and at Margate; and lastly that, other things being equal, intensity of "traumatic atmosphere" is competent to engender erysipelas and pyæmia is proved by the outbreaks of these diseases in the infirmaries of Chester and of Carlisle.

Hospital diseases.

The above teachings, we need scarcely say, are entirely in accordance with the opinions of those who maintain that the prevalence of erysipelas, pyæmia, and the like in the Paris Hospitals is due to hygienic defects. It is known that some French authorities, while admitting the fact of the greater prevalence of these affections in their hospitals than in the hospitals of England, maintain that the difference is chiefly due to constitutional differences between Frenchmen and Englishmen. If it could be clearly shown that the relatively greater number of deaths among Frenchmen after operations and injuries was due to shock, this view might possibly be tenable; but it can scarcely be accepted as the true one if the deaths can be shown to be (as in fact they are) due to the supervention of special complications, known to be a natural consequence of certain defects of hygiene, which very defects prevail with scarcely an exception in the hospitals of Paris.

But admitting that hospital diseases occur at times in all hospitals, the important question still remains—"Do they prevail in smaller "proportion in one kind of hospital than in another kind of hospital, "especially do they prevail in smaller proportion in country than in "town hospitals?" We do not pretend to answer this question in any degree satisfactorily. We append, however, two series of tables which have some bearing on the point. The first series comprises three tables of 12 metropolitan, 23 provincial, and 43 rural hospitals respectively, which show together with other facts the number of cases of erysipelas, diffuse cellular inflammation, phagedæna, and pyæmia present in the various hospitals at the time we visited them, and distinguish the cases of these affections which originated in hospital from the cases which originated outside.

* At the Huddersfield Infirmary the same thing occurred, a few years ago, while the railways were in process of formation.

APPENDIX.

No. 15.

The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.

HEALTH OF HOSPITALS.

Hospital diseases.

LONDON HOSPITALS.	Surgical Practice.																		Medical Practice.	
	"Hospital" Diseases originating in Hospital.				"Hospital" Diseases originating outside.				Open Wounds.	Acute Cases.		Accidents.				Chronic Cases.				
	Erysipelas.	Diffuse Inflammation.	Phagedæna.	Pyæmia.	Erysipelas.	Diffuse Inflammation.	Phagedæna.			Operations.	Others.	Simple Fractures.	Compound Fractures.	Burns.	Others.				Acute.	Chronic.
*St. Bartholomew's	5	2	2	.	3	13	.		142	12	82	48	8	10	40	72	131	86		
Charing Cross	.	.	.	.	5	1	.		26	4	19	4	2	.	7	23	21	27		
St. George's	1	.	3	.	.	.	8		72	3	60	14	2	3	16	58	55	46		
*†‡Guy's	1	2	.	1	.	1	.		126	10	69	41	9	13	34	67	46	144		
King's College	.	.	.	.	1	.	.		35	7	26	8	2	1	6	13	34	21		
London	.	.	2	1	1	.	1		131	9	32	49	17	13	89	49	50	53		
†‡St. Mary's	2	.	2	1	2	.	.		28	2	9	12	5	2	11	28	20	35		
†§Middlesex	3	.	.	.	1	.	1		38	2	22	14	1	4	10	27	42	43		
St. Thomas's	.	.	.	.	.	.	.		57	8	21	24	4	.	9	49	27	50		
University College	.	1	.	.	.	1	.		28	4	11	3	11	1	2	20	22	19		
‖Westminster	.	.	.	1	.	.	.		41	2	13	8	1	.	11	57	34	49		
*Royal Free	.	.	.	.	.	1	1		18	1	16	6	.	.	1	7	12	6		
Total	12	5	7	5	13	17	11		742	64	380	231	62	47	227	470	494	679		
PROVINCIAL HOSPITALS.																				
Birmingham, General	1	.	.	1	.	.	.		58	14	28	14	1	3	21	43	20	44		
Birmingham, Queen's	1	.	.	.	.	.	.		21	4	10	4	2	2	8	18	15	15		
Bristol, General	.	.	.	.	.	.	.		24	6	9	10	1	2	8	37	19	25		
Bristol, Royal	1	.	.	.	.	.	.		41	.	31	6	4	4	6	39	40	45		
Hull	1	.	.	.	.	.	.		25	3	11	5	3	.	11	32	13	22		
Leeds	1	1	.	.	.	.	.		53	5	22	8	6	4	20	28	.	.		
Liverpool, Northern	2	1	.	.	.	.	.		34	3	5	24	5	2	19	11	13	16		
Liverpool, Royal	1	.	.	1	.	3	.		63	13	27	15	2	2	15	32	.	.		
Liverpool, Southern	1	.	.	.	.	.	.		29	4	6	13	5	5	14	10	.	.		
Manchester	.	.	2	.	1	1	.		39	8	20	28	15	9	11	53	26	54		
*Newcastle	2	.	.	.	.	.	.		50	5	23	7	7	3	8	39	4	61		
Sheffield	1	.	.	1	.	2	1		45	2	24	10	7	2	5	39	12	31		
*Aberdeen	1	.	.	.	.	1	1		28	6	15	4	.	2	7	33	13	35		
Glasgow	3	.	.	.	.	.	.		87	21	22	36	9	5	27	61	113	120		
Belfast	2	.	.	.	.	.	.		.	4	6	7	1	2	4	28	12	9		
Adelaide	.	.	.	.	.	.	.		16	1	6	1	.	1	2	29	11	20		
City, Dublin	1	1	1	.	.	.	.		.	1	3	.	2	.	1	22	2	17		
House of Industry	.	.	.	.	.	.	.		.	.	14	9	.	8	7	61	79	65		
Jervis Street	2	.	.	.	1	1	.		.	2	3	3	1	1	6	24	1	12		
Mater Misericordiæ	.	.	.	.	1	.	.		.	1	1	2	1	1	.	26	3	20		
Meath	.	.	.	.	.	.	.		.	5	1	6	1	1	1	28	22	12		
Mercer's	.	.	.	.	.	.	.		.	3	3	5	1	.	1	5	3	9		
*Dr. Steevens's	.	.	.	.	.	.	.		.	3	8	4	1	2	7	50	15	46		
Total	21	3	3	3	3	8	2		633	114	288	221	75	55	209	768	436	679		

* Omitting venereal cases.
† Omitting cases of diseases peculiar to women.
‡ Omitting eye cases.
§ Omitting cancer cases in special wards.
‖ Omitting pensioners.

Hospital diseases.

RURAL HOSPITALS.	Surgical Practice.																Medical Practice.	
	"Hospital" Diseases originating in Hospital.				"Hospital" Diseases originating outside.			Open Wounds.	Acute Cases.		Accidents.				Chronic Cases.		Acute.	Chronic.
	Erysipelas.	Diffuse Inflammation.	Phagedæna.	Pyæmia.	Erysipelas.	Diffuse Inflammation.	Phagedæna.		Operations.	Others.	Simple Fractures.	Compound Fractures.	Burns.	Others.				
Barnstaple	1	.	.	.	.	.	.	2	.	2	1	1	.	5	16	3	22	
†Bath	.	.	.	.	1	.	.	15	1	6	8	2	.	5	16	13	29	
†Bedford	.	.	.	.	.	.	.	10	1	3	2	1	.	5	22	12	31	
†Brighton	2	.	.	.	.	.	.	18	3	12	9	3	1	5	34	16	37	
Bury	.	.	.	.	.	.	.	9	1	3	4	3	1	3	24	5	17	
†Cambridge	.	.	.	.	.	.	.	19	3	5	1	1	1	4	21	6	23	
Canterbury	.	.	.	.	.	.	.	21	2	5	9	1	2	4	24	3	43	
Carlisle	.	.	.	.	.	.	.	.	1	4	3	.	.	5	19	2	8	
Cheltenham	.	.	.	.	.	.	.	16	2	10	4	2	2	4	10	3	15	
†Chester	1	.	.	.	.	.	.	15	.	7	4	4	2	7	13	9	29	
Colchester	.	.	.	.	.	.	.	3	.	1	1	.	.	3	26	1	5	
*†Derby	.	.	.	.	.	.	.	10	2	1	2	.	.	22	13	6	29	
Dover	.	.	.	.	.	.	.	4	.	.	.	1	.	.	5	.	.	
Exeter	.	.	.	.	.	.	.	46	5	11	14	1	1	13	67	6	35	
Gloucester	.	.	.	.	1	1	.	30	2	14	7	.	2	9	34	.	22	
Hereford	1	.	.	.	.	.	.	22	7	1	4	2	.	7	30	.	21	
Huddersfield	.	.	.	.	.	.	1	24	3	4	1	2	.	6	16	2	6	
Ipswich	.	.	.	.	.	.	.	4	2	.	4	2	.	.	12	.	10	
†Lancaster	.	.	.	.	.	.	.	3	.	1	.	.	1	1	1	2	.	
†Leicester	.	.	.	.	.	.	.	45	3	25	3	3	1	4	51	42	24	
Lincoln	1	.	.	.	2	.	.	23	1	12	6	1	2	4	29	.	17	
Maidstone	.	.	.	.	.	.	.	12	.	4	.	3	.	1	13	.	7	
Northampton	.	.	.	.	.	1	.	26	1	10	3	2	3	8	36	10	46	
Norwich	.	.	.	.	.	.	.	40	8	13	6	1	.	15	43	5	44	
†Nottingham	.	.	.	.	.	.	.	12	1	7	5	3	.	15	51	10	35	
†Oxford	.	.	.	.	1	.	.	22	4	12	7	1	3	14	38	4	24	
Plymouth	2	.	.	.	.	1	1	26	.	12	10	1	.	7	21	1	5	
†Reading	.	.	1	.	.	.	.	17	1	7	5	1	3	7	30	3	26	
Salisbury	1	.	.	.	.	.	.	16	3	1	.	3	1	3	23	1	9	
Shrewsbury	.	.	.	.	.	.	.	21	4	1	3	.	1	6	48	5	28	
†*Stafford	.	.	.	.	.	1	.	10	1	3	3	.	.	.	17	3	17	
Taunton	.	.	.	.	.	.	.	2	1	1	4	2	.	.	25	10	23	
†Whitehaven	.	.	.	.	.	.	.	3	.	2	1	.	2	1	3	22	.	
*Winchester	.	.	.	.	.	.	.	12	.	3	.	.	.	.	27	4	19	
†Wolverhampton	3	.	.	.	.	.	.	16	3	1	2	.	3	3	12	2	14	
Worcester	1	.	.	.	.	.	.	.	2	5	3	2	4	6	38	.	30	
York	.	.	.	.	.	.	.	26	1	9	1	1	1	2	33	3	21	
†Arbroath	.	.	.	.	.	.	.	2	1	.	.	.	.	.	5	5	4	
†Dumfries	.	.	.	.	.	.	.	.	1	5	3	.	.	2	16	19	17	
†Dundee	.	.	.	.	.	.	.	37	2	8	2	1	1	12	37	31	24	
†Greenock	.	.	1	.	.	.	.	12	.	4	.	3	1	4	6	41	7	
†Montrose	.	.	.	.	.	.	.	2	2	.	2	.	.	.	6	6	5	
†Paisley	.	.	.	.	.	.	.	16	2	2	2	.	2	5	17	14	11	
Total	12	0	2	0	5	3	2	685	77	237	146	55	40	228	1,015	335†	341	

Hospitals with † prefixed admit fever cases.

* Excluding syphilis.

† Total acute medical cases in the 20 hospitals into which fever is admitted, 235. Total acute cases in the 23 hospitals into which fever is not admitted, 70.

Totals from above Tables, with Per-centages of each Class of Cases, on Total Numbers of Surgical and Medical Cases respectively.

		Surgical Cases.									Medical Cases.		
		Hospital Diseases originated in Hospital.	Hospital Diseases admitted.	Operations.	Simple Fractures.	Compound Fractures.	Burns.	Acute Cases.	Accident Cases.	Chronic Cases.	Total.	Acute.	Chronic.	Total.
LONDON	Total	29	41	—	—	—	—	441	567	470	1,481	494	579	1,073
	Per cent. on total cases	1·9	—	4·3	15·6	4·2	3·2	29·98	38·28	31·74	100	46·0	54·0	100
PROVINCIAL	Total	30	13	—	—	—	—	402	560	768	1,730	436	679	1,115
	Per cent. on total cases	1·7	—	6·5	12·8	4·3	3·2	23·24	32·37	44·39	100	39·1	60·9	100
RURAL	Total	14	11	—	—	—	—	314	469	1,015	1,793	335	841	1,176
	Per cent. on total cases	·7	—	4·2	8·1	3·1	2·2	17·46	26·08	56·46	100	28·5	71·5	100

Hospital diseases.

The result of the tables is, that in 12 metropolitan hospitals, containing 1,481 surgical cases, there were 41 patients suffering from diseases of the class under consideration, contracted previous to admission, while there were 29 in whom such affections had shown themselves subsequent to admission;

That in 23 provincial hospitals, containing 1,730 surgical cases, there were 13 patients only who had been admitted for such diseases, and 30 who had contracted them during their stay in hospital;

And that in 43 rural hospitals, with 1,798 surgical cases, there were 11 patients who had been admitted while labouring under the diseases in question, and 14 in whom they had developed themselves subsequently to admission.

To put the more important of the above series of facts into another form, there were, out of every 100 surgical patients in the metropolitan hospitals, 1·9, out of every 100 in provincial hospitals 1·7, and out of every 100 in rural hospitals ·7, suffering from erysipelas, phlegedæna, or pyæmia contracted in hospital.

The statistics prove little, still that little is in favour of the opinion we have expressed, to the effect that the presence of these affections is dependent less on the kind and position of a hospital than it is on the severity and number of cases likely to be affected by them.

At first sight it may appear that the rural hospitals have a decided advantage, but it must not be forgotten that phagedæna and diffuse inflammation have (as is shown by the statistics of St. Bartholomew's, St. George's, and Charing Cross,) been unusually prevalent during the period which our inquiry embraced, among patients applying for relief at London Hospitals.*

The second series of tables has been devised to show the proportions which deaths from pyæmia hold to the total number of deaths in

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* The tables show, in addition to the facts commented on in the text, other facts of some interest:

1st. There was a larger relative number of medical cases under treatment in the hospitals of London than in the hospitals of either provincial or rural towns. The disproportion would have been considerably more marked had we omitted from computation among the latter classes of hospitals, the hospitals of Scotland.

2d. The proportion of acute medical cases under treatment in the London hospitals was considerably larger than in provincial hospitals, and considerably larger in the latter than it was in rural hospitals; and, indeed, if we exclude from our enumeration those rural hospitals, which, by their rules, admit fever, we shall find that the proportion of acute cases under treatment in the remainder was curiously insignificant. Thus, out of the 335 acute medical cases in rural hospitals, no less than 265 belonged to the 20 hospitals in our list admitting fevers, leaving only 70 acute cases for distribution among the 23 hospitals excluding fever.

3d. With respect to surgery, on the other hand, no disproportion at all equal in importance to this exists between the hospitals of town and country. Acute cases and cases of accident formed a considerably larger proportion of the cases admitted for treatment in the metropolitan and provincial hospitals than they did in the case of rural hospitals. Operation cases, however, are noted as being (in proportion to patients under treatment) most numerous in the provincial hospitals, and about equal in the hospitals of London and those of rural districts. This latter result, however, does not prove that more operations are performed in the country than in London, but proceeds in some degree from the fact of our having taken certain selected operations only for enumeration and comparison, and doubtless, also, in some degree, from the fact of the longer duration of treatment which we have shown to prevail in rural hospitals, a condition obviously leading to the presence of a larger number of operation cases at any one time than would be found if an opposite practice prevailed. The proportions of simple fractures, compound fractures, and burns to the total number of cases under treatment, will be found to be decidedly larger in the metropolitan and provincial than in the rural hospitals. The comparatively trivial character, however, of many of the accident cases admitted into rural hospitals cannot be shown in a tabular form.

London hospitals and in English rural hospitals respectively. Those general hospitals only, of both classes, have been excluded from the tables which, from the nature of their reports, rendered such exclusion necessary. We may add, that we have selected pyæmia, because hospital erysipelas and phagedæna are so rarely fatal, that no result whatever would have been yielded even by the most careful analysis we might have made in regard to them; and that even as respects pyæmia the results are far from trustworthy, especially in the case of country hospitals where post-mortem inquiries into the causes of death are rarely instituted.

Table of deaths from pyæmia compared to deaths from all causes in the following hospitals:*

LONDON.

	Time.	Total Deaths.	Deaths from Pyæmia.		Time.	Total Deaths.	Deaths from Pyæmia.
Charing Cross -	4 years	327	6	St. Mary's -	2 years	341	5†
Guy's - -	2 years	954	7	St. Thomas's -	2 years	423	7‡
St. George's -	1 year	319	7	University -	1 year	159	5
The London -	1 year	318	13	The Royal Free	½ year	33	0
Total deaths - -		2,874		Total deaths from pyæmia -			50

† Three deaths from pyæmia in patients admitted with the disease.
‡ Three deaths from pyæmia in patients admitted with the disease into *medical* wards.

ENGLISH RURAL.

Bath - -	1 year	83	2	Leicester - -	1 year	70	3
Brighton - -	„	55	1	Maidstone -	„	15	1
Bury - -	3 years	6	1	Margate - -	3 years	38	2
Cambridge - -	1 year	44	0	Norwich -	1 year	53	3
Canterbury -	„	33	0	Nottingham -	„	43	0
Carlisle - -	„	19	1	Oxford - -	„	39	1
Cheltenham -	„	16	0	Plymouth - -	„	22	0
Chester - -	„	35	0	Salisbury - -	„	23	0
Chichester - -	„	20	2	Shrewsbury -	„	41	1
Colchester -	„	8	0	Southampton -	„	25	4
Derby - -	„	47	0	Stafford -	„	50	—
Exeter - -	„	54	5	Taunton - -	„	17	1
Gloucester -	„	21	1	Whitehaven -	2 years	18	—
Hereford - -	2 years	46	3	Winchester -	1 year	18	2
Huddersfield -	1 year	39	0	Worcester -	„	37	1
Ipswich - -	„	12	0	York - -	„	32	1
Lancaster -	„	7	1				
Total deaths - -		1,086		Total deaths from pyæmia -			37

* In almost all cases the report for the year 1862 has been chosen. The *latest* year of which we possess records, and one year only, has been almost invariably selected in the case of country hospitals. Had we adopted any other course in regard to these institutions, it would have been easy to increase the proportion of pyæmia in the tables; thus, in 1861, 2 deaths from pyæmia took place in the hospital at Salisbury; in that at Bradford (not included in the list) 4 deaths from pyæmia occurred in

Hospital diseases.

The result is one for which we were certainly unprepared, inasmuch as the proportion of deaths from pyæmia to total deaths is, judging from the tables, considerably greater in country hospitals than it is in town hospitals—in the former, deaths from pyæmia producing 3·4 per cent. of the total number of deaths, in the latter deaths from pyæmia producing 1·7 per cent. only.

But another yet more important fact is indicated, if not established, by these tables, viz. that pyæmia is, both in town and country, actually an infrequent cause of death when compared with all other causes of death, and with the total number of patients admitted for treatment. We allow that many of the returns from which our tables are compiled are far from trustworthy; but there are at least three London hospitals for the accuracy of whose statements we can vouch, viz., Guy's, St. Thomas's, and St. George's, and the results furnished by them agree in the main with those given above. In these three institutions there happened, during the periods specified in the tables, 21 deaths from pyæmia, and 1,696 total deaths; and these occurred among 18,097 patients admitted for treatment. The deaths from pyæmia formed, therefore, 1·23 per cent. of the total number of deaths, and the death-rate due to pyæmia was 0·115 per cent.

Results of operations.

Let us now proceed briefly to consider the results of surgical operations,* especially of certain operations which we have selected for comparison, viz. amputations of the thigh, leg, arm, and fore-arm, re-sections of the larger joints, the operation for hernia and lithotomy.

The following is the list of the above operations which we have compiled from the records of the hospitals we have visited.

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18 months; and in that at Lincoln, out of 64 deaths in 3 years 5 were ascribed to pyæmia. In the Reading hospital, again, in 1862, out of 32 deaths, 2 were due to puerperal fever and puerperel peritonitis respectively; causes of death counted as 2 deaths from pyæmia in the returns above given for St. Mary's Hospital, London.

We have acted somewhat differently as regards London hospitals. We have, as far as possible, in each case included the experience of the year 1862. But it happened in the case of the Charing Cross Hospital, that no deaths from pyæmia had occurred in 1862 or 1861, and as we had trustworthy records extending back 2 years further, with a somewhat different experience, we gave the records of the 4 years. In Guy's there were only 2 deaths from pyæmia in 1862, and we have added, therefore, returns from the report for 1863, which gives 5 cases as having occurred during that year. Similar reasons induced us to quote the experience of St. Thomas's and of St. Mary's for more years than one.

* The success of surgical operations is often spoken of as a test of the healthiness of a hospital; and it is perhaps as good a test as any other single circumstance that can be produced. Nevertheless, if taken alone, it will lead to errors. Some of our country hospitals, which cannot be considered as either eminently well constructed or peculiarly salubrious, do, notwithstanding present evidences of a success in surgery which is not attained even at other rural hospitals much better circumstanced. We allude chiefly to Cambridge and Plymouth.

Operations in London Hospitals.

—	—	Amputation of Thigh and at Hip.		Amputation of Leg and Foot.		Amputation of Arm and at Shoulder.		Amputation of Forearm.		Excision of Hip.		Excision of Knee.		Excision of Shoulder.		Excision of Elbow.		Lithotomy.		Herniotomy.	
		Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.
St. Bartholomew's	3 years	40	9	36	10	21	0	4	0	—	—	—	—	—	—	—	—	31	3	106	44
St. George's	3 years	22	6	22	4	6	1	14	2	—	—	2	0	—	—	2	0	19	2	48	19
Guy's	2 years	25	12	31	4	11	4	3	1	1	0	—	—	—	—	3	0	31	3	41	21
London	1 year	13	5	15	10	9	5	—	—	—	—	—	—	—	—	—	—	10	3	27	13
St. Mary's	3 years	3	2	5	1	3	0	1	0	—	—	—	—	—	—	1	0	9	1	26	11
Royal Free	2 years	4	2	5	4	1	1	1		—	—	—	—	—	—	1	0	2	0	6	6
St. Thomas's	4 years	26	12	22	7	8	2	12	1	1	1	14	4	2	1	7	0	33	4	59	13
University	3 years	16	8	7	1	2	1	3	1	—	—	7	1	—	—	4	0	6	2	22	9
Westminster	1 year	4	1	1	0	—	—	—	—	3	0	1	1	1	0	1	1	3	1	1	1
Total	—	158	57	134	41	61	14	38	5	5	1	24	6	3	1	19	1	135	19	336	136

Operations in Hospitals of large Provincial Towns.

		Amputation of Thigh and at Hip.		Amputation of Leg and Foot.		Amputation of Arm and at Shoulder.		Amputation of Forearm.		Excision of Hip.		Excision of Knee.		Excision of Shoulder.		Excision of Elbow.		Lithotomy.		Herniotomy.	
		Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.
Birmingham General	3 years	36	14	42	11	12	5	19	0	—	—	15	4	—	—	9	2	103*	10	39	19
Birmingham Queen's	1 year	2	0	7	2	1	1	3	0	—	—	1	0	—	—	1	0	2	1	4	3
Bristol General	2½ year	15	2	9	3	1	0	2	0	—	—	5	1	—	—	4	0	2	1	3	0
Bristol Royal	2½ year	8	2	10	1	7	2	5	0	—	—	2	0	—	—	3	0	10	1	6	3
Leeds	6 years	51	11	69	7	26	10	28	3	—	—	—	—	—	—	—	—	13†	1	21†	8
Liverpool Northern	2 years	7	4	10	3	5	3	1	0	—	—	—	—	—	—	2	1	2	0	4	1
Liverpool Royal	3 years	26	14	25	5	8	0	4	1	—	—	4	0	2	1	13	1	13	1	4	3
Liverpool Southern	6 years	16	4	17	6	15	3	—	—	—	—	—	—	—	—	—	—	4	1	10	4
Manchester	10 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40‡	3	—	—
Newcastle	3 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	1	10	4
Sheffield	1 year	11	4	10	3	8	1	—	—	—	—	—	—	—	—	—	—	5	1	2	1
Aberdeen	2 years	15	6	5	2	1	0	5	0	—	—	—	—	—	—	2	0	15	4	3	1
Edinburgh	3 years	61	20	63	16	10	1	10	0	—	—	3	3	4	0	38	2	26	6	21	6
Glasgow	3 years	53	19	65	17	31	8	30	5	2	0	3	1	—	—	22	1	22	2	17	10
Belfast	3 years	17	12	13	3	7	1	9	0	—	—	3	1	1	1	—	—	1	1	13	4
Dublin, Adelaide	1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0	1	1
Dublin City	1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1
Dublin, Meath	2 years	8	1	4	0	1	0	—	—	—	—	—	—	—	—	—	—	1	0	5	1
Dublin, Mercer's	1 year	1	0	—	—	—	—	—	—	—	—	1	0	—	—	—	—	3	0	1	1
Dublin, Dr. Steevens's	19 months	—	—	2	1	—	—	2	0	—	—	2	2	—	—	2	0	1	1	5	1
Total		327	113	351	74	133	35	118	9	2	0	39	12	7	2	96	7	288	35	171	72

* For 10 years. † 3 years. ‡ All in children under 7.

Operations in Hospitals of Small or Rural Towns.

		Amputation of Thigh and at Hip.		Amputation of Leg and Foot.		Amputation of Arm and at Shoulder.		Amputation of Forearm.		Excision of Hip.		Excision of Knee.		Excision of Shoulder.		Excision of Elbow.		Lithotomy.		Herniotomy.	
		Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.
Bath	2 years	7	3	8	1	5	1	—	—	—	—	1	0	—	—	—	—	2	1	11	3
Bradford	18 months	3	1	2	0	—	—	2	0	—	—	—	—	—	—	3	0	—	—	—	—
Brighton	1½ years	3	1	9	1	4	0	—	—	—	—	—	—	—	—	1	0	4	1	9	3
Cambridge	3 years	17	5	7	2	5	1	8	0	—	—	8	3	2	1	1	0	10	0	5	1
Canterbury	1 year	1	1	—	—	1	0	—	—	—	—	—	—	—	—	—	—	3	1	5	3
Cheltenham	1 year	—	—	1	0	—	—	1	0	—	—	1	1	—	—	—	—	1	0	3	1
Colchester	4 years	2	0	10	2	3	0	—	—	—	—	—	—	—	—	—	—	3	1	3	1
Derby	3 years	12	2	8	0	3	0	1	0	—	—	2	0	—	—	—	—	2	0	4	2
Exeter	—	5	0	10	2	3	1	1	0	2	0	9	0	—	—	1	0	4	1	3	1
Gloucester	1 year	5	0	5	0	1	0	3	0	—	—	1	0	—	—	1	0	—	—	2	1
Hereford	3 years	5	1	3	0	2	0	5	1	—	—	—	—	—	—	—	—	—	—	9	4
Ipswich	1½ years	5	0	6	0	—	—	1	0	—	—	—	—	—	—	—	—	6	0	3	2
Lancaster	2 years	—	—	3	0	2	1	2	2	—	—	—	—	—	—	—	—	1	1	—	—
Leicester	3 years	12	3	5	1	2	0	10	0	—	—	—	—	—	—	—	—	24	4	6	4
Lincoln	1 year	3	1	3	0	2	0	—	—	—	—	—	—	—	—	—	—	2	0	1	1
Norwich	3 years	16	5	10	2	1	0	8	2	—	—	2	0	—	—	1	0	42	10	9	6
Oxford	4 years	13	1	19	6	5	3	1	0	—	—	—	—	—	—	—	—	5	0	8	4
Plymouth	2 years	15	1	6	0	2	0	2	0	—	—	1	0	—	—	—	—	3	1	—	—
Portsmouth	—	4	1	8	1	3	1	1	0	—	—	—	—	—	—	—	—	9*	1	4*	2
Reading	3 years	13	3	6	1	2	0	8	1	2	2	3	0	—	—	—	—	3	0	4	1
Salisbury	4 years	11	2	11	1	—	—	1	0	1	1	—	—	—	—	2	0	4	0	4	1

* List imperfect.

Operations in Hospitals of Small or Rural Towns—*continued.*

		Amputation of Thigh and at Hip.		Amputation of Leg and Foot.		Amputation of Arm and at Shoulder.		Amputation of Forearm.		Excision of Hip.		Excision of Knee.		Excision of Shoulder.		Excision of Elbow.		Lithotomy.		Herniotomy.	
		Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.	Total.	Died.
Shrewsbury	1½ years	7	4	13	0	1	0	6	0	—	—	—	—	—	—	2	0	8	1	2	1
Southampton	3 years	5	3	6	3	2	1	3	0	—	—	—	—	—	—	1	0	3	0	1	0
Stafford	1½ years	1	0	5	2	1	0	4	0	—	—	1	0	—	—	1	0	—	—	—	—
Taunton	1 year	2	2	2	0	1	0	1	1	—	—	—	—	—	—	—	—	1	0	—	—
Whitehaven	3 years	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	2	1
York	3 years	5	1	6	1	4	0	—	—	1	0	—	—	—	—	3	0	—	—	3	3
Arbroath	7 years	4	0	7	1	5	0	1	0	—	—	—	—	—	—	2	0	—	—	3	1
Dumfries	3 years	3	1	5	1	2	0	—	—	—	—	—	—	—	—	—	—	1	0	—	—
Dundee	3 years	4	2	16	4	7	3	5	0	—	—	—	—	—	—	3	1	1	0	2	1
Greenock	3 years	—	—	5	2	3	0	2	0	—	—	—	—	—	—	—	—	—	—	—	—
Montrose	3 years	4	2	4	0	—	—	3	0	—	—	—	—	—	—	2	0	1	1	5	3
Paisley	3 years	1	0	5	2	4	1	1	0	—	—	—	—	—	—	1	0	1	0	4	1
Perth	3 years	3	1	5	1	2	1	1	0	—	—	—	—	—	—	1	0	—	—	3	1
Total		101	47	219	57	79	14	82	7	6	3	28	3	2	1	26	1	144	24	118	53

Rate of Mortality per cent. of Operations in preceding List.

	Amputation of Thigh and at Hip.	Amputation of Leg and Foot.	Amputation of Arm and at Shoulder.	Amputation of Forearm.	Excision of Hip.	Excision of Knee.	Excision of Shoulder.	Excision of Elbow.	Lithotomy.	Herniotomy.
London Hospitals	36·0	30·6	22·9	13·1	20·	25·	33·3	5·2	14·1	41·7
Provincial Hospitals	34·5	21·0	26·3	7·6	0·	30·7	28·5	7·3	13·1	42·1
Rural Hospitals	24·0	16·9	17·7	8·5	50·	10·7	50·	3·8	16·6	44·9

As regards amputations the results are decidedly favourable to the success of these operations in rural as compared with town hospitals. But the list is, unfortunately, notwithstanding that we have taken considerable pains in collecting the statistics, very imperfect. The actual causes of death have been furnished to us for a very small proportion only of the total number of cases, and the distinction between amputation for injury and amputation for disease has very frequently indeed not been made.

Let us compare the above list of amputations with another list, compiled without any reference to the subject which we have under discussion.

Results of Operations.

In the year 1858 Mr. Teale published a small work "On Amputation by a Long and a Short Rectangular Flap," and in it he quotes, from the Medical Times and Gazette, the results of the amputations of the thigh and of the leg in the London and provincial* hospitals respectively, for a period of three years ending July 1st, 1857. No doubt these records are incomplete, no doubt they are to some extent inaccurate, but there is equally no doubt that no selection of cases has been made, and that hence they may be taken, at least equally with our own, as affording a not unfair representation of the results of these operations in the two classes of institutions. The results are shown in the following tables.

LONDON HOSPITALS.

	No.	Deaths.	Deaths per Cent.
Amputations of thigh, for accident	52	29	55·7
" " for disease	180	38	21·1
" of leg, for accident	46	20	43·4
" " for disease	66	16	24·2
Total	344	103	29·9

PROVINCIAL HOSPITALS.

	No.	Deaths.	Deaths per Cent.
Amputations of thigh for accident	45	26	57·7
" " for disease	137	33	24·0
" of leg for accident	75	24	32·0
" " for disease	80	19	23·7
Total	336	102	30·4

It would appear from those latter tables, that in amputation of the thigh, both for accident and disease, the results in London hospitals have actually been more favourable than the results obtained in country hospitals; that in amputation of the leg for accident the provincial institutions have had a decided advantage; that in amputation of the leg for disease the results have been as nearly as possible the same; and that the total results have been favourable to London in the insignificant proportion of 29·9 to 30·4. Now slight differences, in a comparison of this sort, where so many sources of fallacy exist, necessarily have no value; we should not be disposed to assume that the tables, because they show a difference in favour of the metropolis as regards amputation of the thigh, prove that amputations of the thigh actually, as a rule, do better in town than in country; we cannot, therefore, allow that the

* This is Mr. Teale's term, by which he means the same as we do by "country" hospitals, viz., all out of London.

Results of Operations.

results, as regards amputation of the leg, which on the other hand are slightly to the advantage of the country, are conclusive evidence that such amputations are habitually, and in the long run, more successful there than in London; but we decidedly draw the inference, that the differences in result between amputations performed in the country and amputations performed in town, as shown in the tables, are no greater than one would expect to find them between amputations performed in successive periods within the walls of any one institution; that they are so insignificant, and at the same time so little uniform, as to make it certain that they depend on accidental circumstances rather than on any differences of hospital salubrity.

But it may very reasonably be asked, what hospitals in the above list are included under the term "Provincial Hospitals"? And it must be acknowledged that the term comprises the Royal Infirmary at Glasgow, and the hospitals of Liverpool, and of a few other large towns, hospitals which are as much town hospitals as those of London itself. We have, therefore, eliminated from the list the amputations performed at the hospitals of the following large provincial towns Glasgow, Liverpool, Hull, Sheffield, Birmingham, and Bristol (Manchester and one or two others not having contributed to it), and have analysed the results in the following tables:—

HOSPITALS OF LARGE PROVINCIAL TOWNS.

	No.	Deaths.	Deaths per Cent.
Amputations of thigh for accident	15	8	53·3
„ „ for disease	31	7	22·5
„ of leg for accident	21	11	52·3
„ „ for disease	16	6	37·5
Total	83	32	38·5

RURAL HOSPITALS.

	No.	Deaths.	Deaths per Cent.
Amputations of thigh for accident	30	18	60·
„ „ for disease	104	26	25·
„ of leg for accident	53	13	24·5
„ „ for disease	65	13	20·
Total	252	70	27·7

From these corrected tables we learn that, for the series of operations comprised in them, the average gross mortality in the hospitals of large provincial towns was considerably greater than the average gross mortality in the hospitals of London; and that the gross mortality in rural hospitals was less than that in London hospitals by about 2 per cent. We learn also that while amputations of the leg for accident and disease were most successful in the country institutions, amputations of the thigh of both kinds were most successful in the hospitals of London; results which on the whole would scarcely perhaps have been expected, and which cannot be pointed to very triumphantly by those who maintain the relative salubrity of country hospitals.

But the death-rate in these as in other cases is, by itself, a very fallacious test of hospital salubrity. Before any fair comparison can be made between the results of amputations in different hospitals it is necessary to know something more even than how many amputations have been performed on account of accident, and how many on account

of disease, or than the relative numbers which have been performed at the several seats of amputation. It is necessary to be acquainted with the condition of patients at the time of operation, and with the actual causes of death in those who die after operation.

It is clear that if the question is whether one hospital is more or less healthy than another, deaths which take place in either as the direct result of fatal violence, or of incurable disease, or from the immediate complications of operation (such as hæmorrhage), ought not to go into account at all. A man who is suffering from extensive injury, and in whom the leg is amputated to give a chance of life, but who has also a rupture of some internal viscus, will die, whether in London or the country; but his death argues nothing against the salubrity of the place in which it occurs. So it is with patients dying of cancer, or of advanced scrofulous disease, in whom amputation may be resorted to as a means of alleviating suffering as well as giving a faint chance of life. So it is still more conspicuously with patients who sink from loss of blood at or after operation, or from some accident during operation. After the exclusion of all such cases, those remain who die rapidly from pyæmia, erysipelas, diffuse inflammation, and tetanus, or who sink gradually from exhaustion.* Now in regard to these important particulars, the cases comprised in Mr. Teale's list afford valuable information, inasmuch as the cases while yet fresh in the memory were put on record in the pages of the Medical Times and Gazette, from which that list is compiled. We have therefore referred to that journal to ascertain the cause of death in every fatal case, with a view of seeing how many deaths were due to hospital influences.

Results of Operations.

It appears therefrom that of the 344 cases of amputation in London Hospitals, 36 died from the direct effects of the original injury or disease; and that of the 252 cases of amputation in rural hospitals, 13 died from the direct effects of the original injury or disease. In both lists, 6 deaths were due directly to the operation. Thus 42 cases in the London list and 19 in the country list require to be deducted. This leaves for comparison of the London list 302 amputations, with 61 deaths, and of the country list, 233 amputations, with 51 deaths.

Of the remaining 61 deaths in the London list, the cause of death is not distinctly stated in four (in two of these the patients seem to have been in poor health, in a third there were extensive injuries, and in the other, nothing beyond the fact that the case was one of primary amputation is stated); 20 died from causes connected with the general condition of health at the time of operation (six of these were exhausted by intemperance, seven by protracted discharge or sloughing, four by phthisis or cancer, one by hæmorrhage the result of the hæmorrhagic diathesis, one by disease of the arteries, and one by disease in other parts of the body). The remaining 37 died of so-called hospital diseases (viz., 33 of pyæmia, two of erysipelas, and two of tetanus).

Of the remaining 51 deaths in the country list, the cause of death is not distinctly stated in six (two of these were in bad health from struma and cancer, one is said to have been in good health, and the other three may be presumed to have been so, since the contrary is not dis-

* It is extremely difficult to form any opinion, from short notices such as those in the Medical Times, as to which of this latter class of cases (viz. patients whose death is attributed to "exhaustion") may have died from causes connected with the hospital, and which from the results of previous disease. We have, therefore, in making a comparison of the deaths in London and rural hospitals after amputation of the thigh and leg, put aside all the cases which are said to have died of exhaustion, and reckoned them as dying of the effects of previous diseased conditions. In doing this we have given an advantage to the country hospitals, in which this cause of death is alleged more frequently.

Results of Operations.

tinctly stated); 20 died from causes, which either were or might have been associated with their general condition of health at the time of operation (three were exhausted by age, two by intemperance, five by phthisis, two by cancer, five by various diseases vaguely stated, one by disease of the arteries, two are merely recorded as cases of exhaustion, but the reports leave it doubtful, both in these two and in four other cases, whether death was really unconnected with hospital influences); 25 cases remain in which death may be assumed to have been due to hospital diseases (in 20 death was ascribed to pyæmia, in two to erysipelas, and in three to tetanus).

It should be added that of the 37 persons who died of hospital diseases in London hospitals, 16 were reduced by various causes (viz., three by intemperance, three by previous operations, two by phthisis and cancer, one by constitutional disturbance after a burn, and seven probably by the diseases for which they were admitted); 21 were assumed to be in good health, this being stated in nine cases, and apparently implied in the others. Of the 25 persons who died of hospital affections in rural hospitals, 11 were in feeble health (nine from causes not distinctly stated, one from cancer, and one from intemperance); 14 appear to have been in good health, this being expressly stated in regard to seven.

On the whole, the above analysis shows—

1st. That out of 344 cases of amputation in London, 36 (or 10·4 per cent.), and that out of 252 cases of amputation in the country, 13 (or 5·1 per cent.) died in consequence of the injuries or diseases on account of which the operations were performed,—a fact confirmatory of the general belief that operation cases treated in London are, on the average, cases of greater gravity than those treated in the country.*

2d. That (excluding from computation the above fatal cases, and also those in which death was dependent on the operation itself,) out of 302 cases of amputation in London, 37 (or 12·2 per cent.), and out of 233 cases of amputation in the country, 25 (or 10·7 per cent.) died from hospital diseases,—a fact tending to show that the greater success of surgical operations generally believed to be attained in country hospitals is extremely doubtful, and that a person with a given disease or injury which requires amputation has as good a chance of recovery (speaking generally) in a metropolitan as in a rural hospital.

Before we leave this subject it will be interesting to compare the results of amputations performed in the Paris hospitals with those obtained among ourselves. We have previously pointed out the very great prevalence of secondary surgical diseases among the operation cases in the French capital, and the fact that certain surgical operations which are performed here with comparative impunity prove there almost certainly fatal. The statistics which we quote, like those of most of our English hospitals, are far from accurate, but we have been informed that there has been no special enumeration of fatal cases, and that the statistics convey substantial truth.

* There is, we believe, very little doubt, that if we could take a considerable number of the accident cases requiring operation admitted into the wards of a hospital in a large manufacturing or seaport town, and compare them with an equal number of accident cases requiring operation admitted into a purely agricultural hospital, we should find the former comprised a much larger proportion of complicated cases, of cases of "smash," than the latter; in other words, the compound fractures arising from railways, from machinery, from building operations, among shipping, and in dockyards, are more likely to be associated with other grave injuries than those occurring in country towns and among agricultural labourers.

AMPUTATIONS in PARIS HOSPITALS during 1861.

	THIGH.			LEG.			UPPER ARM.			FORE-ARM.		
	Total.	Deaths.	General Mortality.	Total.	Deaths.	General Mortality.	Total.	Deaths.	General Mortality.	Total.	Deaths.	General Mortality.
Hôtel Dieu	5	3	60·00	6	3	50·00	1	.	..	1	.	..
Pitié	2	1	50·00	4	2	50·00	2	.	..	.	.	..
Charité	1	1	100·00	2	1	50·00	2	1	50·00	.	.	..
St. Antoine	4	4	100·00	9	4	44·44	1	.	..	1	1	100·00
Necker	2	1	50·00	5	5	100·00	.	.	..	.	.	..
Cochin	.	.	..	3	3	100·00	.	.	..	.	.	..
Beaujon	.	.	..	3	3	100·00	.	.	..	.	.	..
Lariboisière	11	9	81·82	4	3	65·00	4	3	75·00	.	.	..
St. Louis	3	2	66·67	8	6	75·00	.	.	..	2	.	..
Cliniques	2	2	100·00	3	2	66·66	.	.	..	.	.	..
Enfants Malades	.	1	..	.	.	..	1	.	..	.	.	..
St. Eugénie	4	2	50·00	.	.	..	2	1	50·00	.	.	..
Others	.	.	100·00	3	3	100·00	.	.	..	.	.	..
Total	35	26	74·28	50	35	70·00	13	5	38·45	4	1	25·00

It appears from these tables that amputation of the thigh in all the Paris hospitals, during the year 1861, was attended with a mortality of 74·28 per cent., that amputation of the leg was attended with a mortality of 70 per cent., and that the mortality in amputations of the arm and fore-arm was 38·45 and 25 per cent. respectively. The death rates are evidently enormous, and surely not to be explained by differences either in the constitution of those operated upon, or in the nature of the injuries or diseases for which they were admitted. Indeed, it is allowed that pyæmia and such diseases are in great measure the causes of these alarming results.

The cases of resection of the larger joints which we have collected are too few to allow of any comparative estimate of their success in different hospitals being made. We have however given the numbers and the per-centage mortality for each of the three classes under which we have arranged hospitals.

If now we take lithotomy we find that the difference between town and country hospitals is, as regards the mortality of this operation, purely trivial. Indeed, were we to draw conclusions from our own list alone they would be unfavourable to rural hospitals, for the actual per-centages of deaths are 12·1 for hospitals in large country towns, 14·1 for hospitals in London, and 16·6 for hospitals of the rural class. But to prove how little the success of stone cases is affected injuriously by hospital atmosphere, we may draw attention to the fact, that out of 33 cases operated on in St. Thomas's Hospital during the four years ending December 31st, 1860, there were only four deaths, and that of these deaths one was due to perforation of the stomach by an ulcer, and one to exhaustion, dependent, not on the operation, but on the disease for which the operation was performed. And as regards the other two, although no cause of death is assigned in the register, we have reason to know that the deaths were not due to so-called hospital diseases. Again, out of 41 cases of lithotomy performed at Guy's Hospital during the three years ending December

Operations.

31st, 1863, there were five deaths, of which not one was due to hospital complications. But on the comparative results of this operation it is the less necessary for us to dilate, since Mr. Thompson has published in his recent work, "Practical Lithotomy and Lithotrity," a series of 1,827 cases of lithotomy performed in nine hospitals, of which four are rural hospitals (Norwich, Oxford, Leicester, and Cambridge), two are provincial town hospitals (Leeds and Birmingham), and three are London hospitals (Guy's, St. Thomas's, and University College). The result shows little difference in the rate of mortality at any of the hospitals, except perhaps at those of Leicester and Cambridge, where the mortality is considerably lower than at the others.* But the difference between the rate of mortality in the London hospitals and most of the country hospitals is not greater than the differences which exist among country hospitals themselves. It is evident, however, (when one considers how important are the influences of age and some other circumstances in determining the results of this operation,) that little reliance can be placed on any comparison of statistics in which the ages of the patients, the size of the stones, and the condition of the kidneys are omitted; and that, unless these facts and others relating to the causes of death be specified, it is impossible to form any kind of estimate of the effects of hospital influences over the death-rate of cases of lithotomy.

Again, as regards the operation for hernia, the difference between town and country hospitals is scarcely so great as might have been expected. The success or non-success of this operation depends in great measure on the period at which herniotomy is performed, and in very slight degree, if at all, on pyæmia, phagedæna, and the like. The difference in mortality, though small (the per-centage mortality being for London hospitals 41·7, for provincial town hospitals 42·1, and for rural hospitals 44·9), is on the whole favourable to the London hospitals, and probably does really depend on circumstances connected with the operation itself, and the condition of patients at the time of operation.

Puerperal diseases in Lying-in hospitals.

We have finally to say a few words with regard to the results of midwifery practice in wards or hospitals specially devoted to the reception of pregnant women. The lying-in hospitals of England and Scotland are for the most part small and insignificant institutions; indeed, the only lying-in hospital of much importance in Great Britain is the Rotundo Hospital in Dublin. In this admirable institution, admirable alike in its construction and in its arrangements, the results of midwifery practice are generally not unsatisfactory. In the years ending March 31st, 1860, and March 31st, 1861, respectively, its mortality was 1·6 and 1·5 per cent: In the latter part, however, of the year 1861, and the commencement of 1862, there was during a period of between two and three months a severe epidemic of puerperal and of scarlet fevers. Out of 212 patients delivered 46 were attacked with puerperal fever, of whom 28 died, and eight were attacked with scarlet fever, of whom seven died. The hospital was temporarily closed, and, owing partly to this circumstance, partly to a very sparing admission of patients after the reopening, and partly to the heavy mortality arising from the epidemic, the death-rate for the year was raised to 8·13 per cent.

* The fact that the average mortality is lowest of all at Cambridge is of some interest, for the average mortality after lithotomy has been used as a test of the healthiness of the hospital. But the hospital at Cambridge is confessedly very defective in construction and in sanitary arrangements, and has been pronounced to be so in a report drawn up by a sub-committee of the governors.

Puerperal diseases in Lying-in Hospitals.

It is worthy of remark that puerperal fever broke out during the same year in the other Dublin lying-in charity, and seems to have been prevalent in Dublin itself. But though occasional cases of puerperal fever are not uncommon in the Rotundo, epidemic outbreaks are comparatively rare, and when they do occur are regarded as due rather to some epidemic influence than to spread by contagion. So strongly is this opinion held, that sporadic cases arising in the hospital are never (except when they are about to die) separated from the other labour cases, and it is asserted that no ill-consequences whatever ensue from this practice. In the epidemic just referred to, there was evidently some close connexion between the prevalence of puerperal fever and the prevalence of scarlatina. The outbreak furnishes, therefore, an example of the well-established fact that scarlet fever, typhus, and other exanthemata, are not only peculiarly apt to attack puerperal women exposed to their contagious influences, but prove peculiarly fatal to them, and that these poisons constitute a fruitful source of contagious forms of the so-called puerperal fever.

But although in Dublin it seems to be questioned, there can, we believe, be little doubt that puerperal women have many points of resemblance to operation cases, and that the presence of a "traumatic atmosphere," such as is created by the accumulation of large numbers of women recently confined, is attended with many of the dangers which certainly attend a similar atmosphere in a surgical ward. We do not mean that the traumatic atmosphere in itself creates disease, but we believe that puerperal women are peculiarly susceptible of those poisonous influences which, among surgical patients, produce erysipelas, pyæmia, and the like, and that when these poisonous influences are present the traumatic atmosphere favours their injurious operation. It need scarcely be said that a very large proportion of cases of puerperal fever are cases of pyæmia originating in some inflammatory condition of the uterine walls, and that it has been over and over again proved that this particular form of the disease may be conveyed by the medical attendants, by the nurses, and by dressings and the like.

Now the presence in any institution, of the former variety of the disease, that related to the exanthemata, must depend on the entrance into that institution of some form of exanthematous poison. It is an accident, therefore, which can only be occasional, but which can scarcely fail occasionally to occur, and which, when it does occur, in large institutions specially, is extremely likely to produce grievous consequences.

The latter variety is, doubtless, as is the case with non-puerperal pyæmia, in some instances dependent solely on causes belonging to the patient herself; and most likely many of the sporadic cases which occur, whether in hospitals or in private practice, are of this kind. But it is certain that this disease, like pyæmia in surgical wards, becomes at times, and from similar causes, endemic in hospitals, and that decided measures are then needed for its eradication. There is no doubt that sporadic cases of puerperal pyæmia occur in other British maternity hospitals besides the Rotundo, and occasionally a few cases occur within a short time of one another; but these institutions are on so small a scale, and can be so soon emptied when any sign of danger manifests itself, that anything amounting numerically to an epidemic ought scarcely to arise; still we believe that all the London maternity hospitals have had, from the prevalence of puerperal fever, to be closed on more than one occasion. The experience of the York Road Lying-in Hospital, more, however, formerly than of late years, has been particu-

APPENDIX.

No. 15.
The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.

HEALTH OF HOSPITALS.

larly unsatisfactory.* In Paris there are, besides one large lying-in hospital (La Maison d'Accouchement), in almost all the general hospitals, beds (numbering from 14 to 52) set apart for the delivery of females; and it is a striking fact that the results here are (for almost every hospital) analogous in many respects to those of surgical operations. The appended tables show how high the mortality among lying-in women is universally in the Paris hospitals, and at the same time how very largely this high mortality depends on "puerperal fever and puerperal peritonitis," which terms doubtless signify (since deaths from eruptive fevers are distinguished) essentially pyæmia.

Puerperal diseases in Lying-in Hospitals.

MEDICAL STATISTICS of the Obstetrical Department of the Paris Hospitals for 1862.

—	Delivered in Hospital.	Left without being delivered.	Total.	Dead.	Per-centage of Deaths.	Cancer of Os Uteri.	Small-pox.	Laryngitis.	Pneumonia.	Diarrhœa.	Abscess of Ovary.	Phthisis.	Eclampsia.	Heart Disease.	Metrorrhagia.	Typhoid Fever.	Total.	Total died from Puerperal Fever and Peritonitis.	Per-centage of those dying of Puerperal Fever.
Hôtel Dieu -	895	141	1036	32	3·57	.	.	.	.	.	.	2	1	1	1	1	6	26	2·9
Pitié - -	466	42	508	26	5·57	.	.	.	1	1	.	.	.	.	.	.	2	13	2·8
Charité - -	270	5	275	24	8·88	.	1	.	.	.	.	2	1	.	2	.	5	17	6·3
St. Antoine -	314	41	355	21	6·68	.	.	.	1	.	.	.	.	.	.	.	1	20	6·3
Necker - -	212	7	219	16	7·54	.	2	.	.	.	.	2	1	.	1	.	6	10	4·7
Cochin - -	23	3	25	3	13·63	.	.	1	.	.	.	.	.	.	.	.	1	1	4·5
Beaujon - -	273	14	289	15	5·45	.	.	.	.	.	.	2	.	.	1	.	3	12	4·3
Lariboisière -	818	78	896	34	4·15	.	.	.	2	.	.	3	1	.	2	.	6	25	3·1
St. Louis - -	694	63	757	63	9·07	.	.	.	.	.	.	1	1	.	.	.	2	61	8·7
Cliniques - -	769	65	834	73	9·49	1	2	.	3	.	1	.	3	.	3	.	12	61	7·9
Maison de Santé	32	..	32	3	9·37	1	1	.	.	.	.	.	.	.	.	.	2	1	3·1
Maison d'Accouchement -	2204	99	2303	166	7·53	3	1	1	4	2	3	4	1	1	.	2	23	144	6·5
Total -	6971	558	7529	476	6·82	5	7	2	12	5	5	16	8	2	10	3	75	401	5·7

The Maison d'Accouchement, though in many respects a valuable and well-conducted institution, cannot be compared for a moment with the Rotundo Hospital; and as regards the wards devoted to midwifery practice in the French general hospitals, they have, like the other wards of the same hospitals, all the excellences and all the defects which characterize the French system. To these defects we, with many others, have attributed in great measure the unfortunate results of capital operations performed in Paris, and to these same defects we cannot hesitate to ascribe the great and fatal prevalence of puerperal diseases.

It appears, however, that the mortality in lying-in hospitals is almost invariably greater than that among women delivered at their

* From figures furnished by the late Dr. Rigby, and put into our hands by Dr. Barnes, we find that during the 24 years terminating with 1856, 4,960 deliveries were effected in the York Road Hospital, and 146 deaths occurred, yielding a mortality of 2·9 per cent. In the first half of this time the deliveries amounted to 2,061, the deaths to 103, and the death-rate to 5·0 per cent. In one of the years included in this latter period, viz. the year 1841, 117 women were delivered, and 15 (or 12·8 per cent.) died, and in another year, 1838, 71 women were delivered and 19 (or 26·7 per cent.!) died. Puerperal fever has occurred in this institution since 1856. The last outbreak (connected with the appearance of scarlet fever) was towards the latter end of 1861. The place had to be closed for three or four months.

Puerperal diseases in Lying-in Hospitals.

own houses.* A mortality of between one and two per cent. is, in ordinary years, we believe, the mortality occurring in the Rotunda. In small and well-conducted establishments, like those in Liverpool and in Glasgow, the mortality is usually, we believe, about the same, and on the whole the general mortality of the lying-in hospitals of London is probably not very different. A death-rate of one or two per cent. may not appear very alarming; but when we know that the per-centage of deaths among lying-in women out of hospital is considerably less than this, often not exceeding ·3 or even ·2, we are led to suspect that the excess of mortality above these numbers may depend upon hospital influences. Of course it is possible that the difference may be due to peculiar circumstances, moral or otherwise, connected with the applicants for admission into such hospitals; and it is equally possible that it may depend on the admission of a more than proportionate number of difficult and complicated cases; but, unfortunately, here, as elsewhere, the want of accurate records renders the determination of this point at the present time a matter of great difficulty, if not of actual impossibility.

CONCLUSIONS.

The general conclusions to which the foregoing remarks on the health of hospitals lead us may be briefly summarized:—

First.—The general death-rates of hospitals afford no test of the relative salubrity of hospitals. The condition of a hospital death-rate is determined almost exclusively by the character of the cases admitted, and by the rules or the practices which regulate their discharge. The variations of death-rate due to hospital insalubrity are confined within very narrow limits, and are wholly or almost wholly lost among the far greater variations dependent on the conditions above referred to.

Second.—English rural hospitals have acquired, on false grounds, a reputation for comparative healthiness. By their regulations, their practice, or their position, they receive habitually a far less serious class of cases than is admitted into the hospitals of London and other large towns. This difference in the quality of the practice is much greater in respect of medicine than of surgery, but is considerable even as regards surgery. The result is marked lowness of death-rate, even (in many cases) in the presence of a high degree of hospital insalubrity.

* Dr. Barnes informs us that during five years 18,751 poor women were delivered at their own homes by the Royal Maternity Charity of London, and that of these, 56 (or scarcely ·3 per cent.) died; but that 14 only of them died of puerperal fever. He calculates that during the same period the number of deliveries effected in the four metropolitan lying-in hospitals does not exceed 10,000, and he shows from the Registrar General's returns that the deaths occurring in these institutions were 129. This number, assuming 10,000 women to have been delivered, gives a mortuary rate of 1·3 per cent. Further, he has summed up the results of several continental lying-in hospitals, and tells us that out of 14,253 deliveries 247 women (or 1·7 per cent.) died. We may add that during the year 1863, 3,000 women were delivered by the Royal Maternity Charity, and that of these six only died, yielding a death-rate of ·2 per cent. only. Whilst these pages are going through the press our attention has been called to a work entitled "Puerperal Fever in the St. Petersburgh Midwives' Institution from "1845–1859; with a Comparative Account of the Experience of the other Lying-in "Hospitals and the Town Practice of St. Petersburgh. By Dr. Th. Hugenberger, "senior, Professor at the Midwives' Institution, 1862." Dr. Hugenberger shows that during the 15 years (1845-59) 8,036 women were delivered in the Midwives' Institution, of whom 306, or nearly 4 per cent., died. He shows further that, excluding the country and non-Christian communities, there were registered in the 15 years 235,293 births, and 2,520 deaths in childbed; that of these, 25,711 labours and 1,117 deaths belonged to the hospitals; and that hence, as an easy calculation will show, the mortality per cent. in the hospitals was 4·3, while the mortality per cent. for home practice was ·66 only.

Third.—A considerable number of cases, including most cases of non-infectious medical diseases, and many surgical cases in which there is an absence of external sores, are, we believe, little, if at all, injuriously affected by the various conditions to which they are exposed in the hospitals of Great Britain. They bear, and indeed suffer no inconvenience from, a degree of crowding, and a condition of ventilation which would be in the highest degree dangerous in the presence of fevers, or for the treatment of surgical operations and injuries.

Fourth.—The presence of infectious diseases in a ward is always attended by a certain amount of risk, but the danger of their spread is greatly enhanced by over-crowding, deficient ventilation, and accumulation of infectious cases.

Fifth.—Medical diseases, such as typhoid fever, diphtheria, and the like, rarely originate in hospitals.

Sixth.—Wherever surgical cases presenting open sores (especially operation cases and cases of accident) are received, hospital diseases, such as erysipelas, pyæmia, and phagedæna are liable to arise. The liability of these affections to originate and to spread is considerably influenced by concentration of "traumatic" atmosphere, but their development and spread are both chiefly dependent on want of cleanliness, bad drainage, over-crowding, defective ventilation, and the like.

Seventh.—Puerperal women are exposed in hospitals to two dangers. Like patients after surgical operations, and for the same reasons, they are peculiarly sensitive to the influences of those conditions on which pyæmia and erysipelas depend; they are also highly susceptible to the poison of contagious fevers. The accumulation of puerperal women in a ward creates a traumatic atmosphere, with all its risks, and furnishes material on which the poison of an infectious disease accidentally introduced acts with terrible virulence. But labour is a natural process, and only in a comparatively small number of cases calls for the exercise of special skill either in nursing or medical treatment; there are, therefore, generally, in the case of puerperal women, none of those special objects to be gained, by becoming the inmates of a lying-in charity, which the diseased and maimed seek by admission into general hospitals.

Lastly.—The health of hospitals, so far as we can ascertain, is influenced in a far greater degree by conditions belonging to hospitals themselves than by conditions of external atmosphere, of site, of soil, and the like. And, we may add, the healthiness of hospitals is less dependent on the form and size and distribution of wards than it is on ventilation, drainage, cleanliness, and proportion of inmates to space. A hospital of defective construction may, by careful attention to these latter conditions, be rendered, even in a large town, comparatively healthy; and a hospital built on the most approved plan, and occupying the choicest site, may be rendered in the highest degree unhealthy by their neglect.

List of Civil Hospitals in Great Britain and Ireland, visited by the Writers of the foregoing Reports, comprising Statistical Information on various Points.

	Year.	No. of Beds.	No. of Patients in House at time of visit.			Average No. of Patients in House.	Patients per Annum.			Death Rates per Cent.		
			Medical.	Surgical.	Total.		Medical.	Surgical.	Total.	Medical.	Surgical.	Total.
METROPOLITAN HOSPITALS.												
F St. Bartholomew's	1862	632	217	340	557	—	—	—	5,389	—	—	11·2
Charing Cross	1862	118	48	59	107	93	419	531	950	13·1	3·7	7·8
F St. George's	1862	345	101	156	257	307	1,652	2,061	3,713	11·682	6·453	8·779
F Guy's	1862	574	214	317	531	494	2,000	2,888	4,888	14·49	6·16	9·61
F King's College	1861	147	55	63	118	120	712*	740*	1,332	14·5	8·0	10·7
London	1862	457	103	249	352	364	1,300	2,884	4,184	10·4	6·4	7·6
F St. Mary's	1862	155	61	69	130	130	904	811	1,715	10·5†	8·5†	10·2
F Middlesex	1862	203	92	115	207	—	—	—	2,278	—	—	11·6
F St. Thomas's	1860	520	77	115	192	1	1,920	1,951	3,871	12·0	5·9	8·9
	1863	207					888	958	1,846	13·1	7·7	10·3
University	1862	115	41	52	93	—	—	—	—	—	—	12·67
F Westminster	1862	191	83	92	175	154	—	—	1,328	—	—	10·44
Royal Free	1862	84	18	52	70	84	—	—	1,254	—	—	7·2
ENGLISH PROVINCIAL HOSPITALS.												
F Birmingham, General	1862	226	64	124	188	206	—	—	2,056	—	—	10·2
Birmingham, Queen's	1861-62	135	30	48	78	—	751	917	1,668	—	—	8·7
Bristol, General	1862	130	44	73	117	114	—	—	1,220	—	—	4·96
Bristol, Royal	1862	242	85	100	185	208	1,314	1,631	2,945	6·7	3·7	5·6
Hull, General	1862	147	35	65	100	90	433	538	971	8·6	6·8	7·1
Leeds	1862	133	43	93	136	166	—	—	1,735	—	—	4·7
Liverpool, Northern	1862	130	29	69	98	95	—	—	1,229	—	—	5·8
Liverpool, Royal	1862	230	30	106	136	189	1,093	1,380	2,473	9·7	4·9	7·6
Liverpool, Southern	1862	106	17	57	74	77	323	797	1,126	—	—	6·2
F Manchester, Royal	1863	260	80	138	218	—	—	—	1,905	—	—	13·6
Newcastle	1863	215	65	115	180	178	514	1,052	1,566	—	—	—
Sheffield	—	—	—	—	—	—	—	—	—	—	—	—
ENGLISH RURAL HOSPITALS.												
Barnstaple	1860-62	74	25	25	50	—	—	—	About 500	—	—	About 3·0
F Bath, United	1862	99	42	38	80	79	537	518	1,055	9·3	6·4	7·9
F Bedford	1860-62	106	43	34	77	75	—	—	687	—	—	3·05
Bradford	1862	65	—	—	—	60	—	—	437	—	—	6·5
F Brighton	1862	155	53	67	120	126·7	—	—	1,064	—	—	5·16
Bury	—	78	22	39	61	—	—	—	—	—	—	—
F Cambridge	1860-62	102	31	36	67	78	—	—	637	—	—	5·5
Canterbury	1861-62	120	46	47	93	81	—	—	721	—	—	5·2
Carlisle	1862-63	50	10	32	42	46	—	—	419	—	—	4·6
Cheltenham	1860-62	92	18	34	52	56	—	—	599	—	—	3·01
F Chester	1862-63	125	33	37	75	746·80	—	—	753	—	—	4·9
F Chichester	1862	80	12	26	38	40·45	176	176	352	—	—	5·0
Colchester	1862	90	6	25	31	45	—	—	262	—	—	3·0
F Derby	1863	147	35	51	86	103	—	—	906	—	—	5·18
Dover	1862	14	—	—	11	—	—	—	72	—	—	4·1
Exeter	1862	233	43	112	155	185	—	—	1,354	—	—	4·06
Gloucester	1862	161	22	68	90	99	—	—	603	—	—	5·1
Hereford	1862	90	23	51	74	76	—	—	553	—	—	3·6
Huddersfield	1862	55	8	30	38	43	—	—	323	—	—	10·9
Ipswich	1862	42	10	20	30	38	—	—	240	—	—	5·0
F Lancaster	1862	27	2	4	6	7·6	38	38	76	7·9	10·5	9·2
F Leicester	1862	200	66	89	155	—	—	—	—	—	—	5·7
Lincoln	1862	101	17	46	63	—	—	—	656	—	—	3·7
Maidstone	1862	35	7	21	28	—	66	83	149	12·1	8·4	10·06
Northampton	1862-63	126	56	83	119	112	—	—	1,029	—	—	7·32
Norwich	1862	149	49	86	135	121	—	—	936	5·02	5·14	—
F Nottingham	1862-63	142	45	82	127	134	—	—	1,202	—	—	3·57
F Oxford	1862	143	28	78	106	2120	—	—	896	—	—	4·9
Plymouth	1860-62	70	6	51	57	65	—	—	343	—	—	6·2
Portsmouth (General and Lock)	1862	61	—	—	50	About 50	—	—	—	—	—	3·04
F Reading	1862	107	29	54	83	80	260	471	731	5·00	4·03	4·3
Salisbury	1861-62	100	10	36	46	77	453	548	1,001	3·3	1·4	2·3
Shrewsbury	1861-62	133	33	63	96	126	—	—	1,030	—	—	3·98
Southampton	1862	72	25	42	67	70	328	355	683	—	—	3·8
F Stafford	1862	105	20	26	46	70	—	—	661	—	—	7·5
Taunton	1862	99	33	33	66	69	—	—	741	—	—	2·3
F Whitehaven	1862	54	22	9	31	—	—	—	193	—	—	9·3
Winchester	1861-62	111	23	37	60	73	—	—	788	—	—	2·28
F Wolverhampton	1862	107	18	27	45	58	154	392	546	7·7	9·9	9·3
Worcester	1862	101	32	60	92	88	—	—	—	—	—	5·55
York	1862	80	24	48	72	About 60	—	—	595	—	—	6·5

All Hospitals to which the Letter F is prefixed, admit fever cases either into the general wards, into special wards, or into a detached fever house; the practice of separate fever houses is however almost universal in English rural hospitals: only those at Bath, Chichester, Reading, and Oxford treat cases of fever in the general wards.

* Including cases in house at beginning of year. † Excluding 11 patients admitted dead.

APPENDIX.

No. 15.

The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.

HEALTH OF HOSPITALS.

List of Civil Hospitals in Great Britain and Ireland, visited by the Writers of the foregoing Reports, comprising Statistical Information on various points—*Continued.*

	Year.	No. of Beds.	No. of Patients in House at time of visit.			Average No. of Patients in House.	Patients per Annum.			Death Rates per Cent.		
			Medical.	Surgical.	Total.		Medical.	Surgical.	Total.	Medical.	Surgical.	Total.
SCOTCH HOSPITALS.												
F Aberdeen {General / Fever}	1862	191 / 38	36 / 18	75	124	126	—	—	1846	8·3	2·4	5·
F Arbroath	1862	60	9	5	14	—	112	65	177	17·8	3·0	12·4
F Dumfries	1861	90	33	27	60	—	164	228	892	11·5	1·7	5·8.
F Dundee	1862	170	55	63	118	140	961	638	1,599	9·9	2·5	7·06
F Edinburgh	—	519	—	—	—	—	—	—	—	—	—	—
F Glasgow {General / Fever}	1862	456 / 156	140 / 93	181	321 / 93	319 / 67	2,150 / 985	1,507 —	3,657 / 985	9·2 / 16·3	8·4 —	8·8 / 16·3
F Greenock {General / Fever}	1862	40 / 70	12 / 36	18 —	30 / 36	— / —	238· / 254	253 —	439 / 254	13·5 / 12·2	9·4 —	11·4 / 12·2
F Montrose	1862	52	11	8	19	—	—	—	319	—	—	6·0
F Paisley	1862	132	21	30	51	43	—	—	609	—	—	7·3
F Perth	1862	68	—	—	38	36	—	—	607	—	—	7·07
IRISH HOSPITALS.												
F Belfast	1862	107	21	52	73	73·5	374	614	988	12·8	4·56	7·69
Dublin:												
F Adelaide	1862	99	31	40	71	64·	—	—	933	—	—	5·9
F City of Dublin	1862	77	19	29	48	—	—	—	612	—	—	4·5
F Hardwicke	1862	78	73	—	73	55·5	1,142	—	1,142	8·14	—	8·14
Richmond	1862	110	—	99	99	96·5	—	1,191	1,191	—	3·5	3·5
Whitworth	1862	81	71	—	71	64·	1,026	—	1,026	6·14	—	6·14
Jervis-street	1862	59	13	40	53	—	—	—	—	—	—	—
Mater Misericordiæ	1862	73	23	32	55	—	—	—	578	—	—	3·6
F Meath	1862	112	54	43	77	80	—	—	1,072	—	—	4·66
Mercer's	1862	66	13	18	30	—	—	—	612	—	—	4·6
F Dr. Steevens's	1862	223	61	93	154	184	—	—	2,414	—	—	2·8
SPECIAL HOSPITALS.												
F Hospital for Sick Children, London.	1862	—	36	14	50	46	—	—	343	—	—	11·2
Children's Infirmary, Liverpool.	1862	20	5	15	20	—	54	34	88	7·4	2·9	5·6
F Dreadnought, London	—	—	—	—	—	—	—	—	—	—	—	—
Consumption Hospital, Brompton	8 years	210	—	—	—	—	551 to 935	—	551 to 936	13·26 to 19·23	—	13·26 to 19·23
F London Fever	1862	182	77	—	77	—	2,656	—	2,656	17·7	—	17·7
F Belfast Fever	1862	445	—	—	—	—	2,574	—	2,574	11·4	—	11·4
F Cork Street Fever, Dublin	1862-63	150	—	—	—	89·6	1,700	—	1,710	5·5	—	5·5
F Newcastle Fever	1861	36	9	—	9	—	42	—	42	4·7	—	4·7
F Small-pox, London	16 years	100	—	—	—	—	—	—	—	19·9	—	19·9
York Road Lying-in, London.	24 years	32	12	—	12	—	—	—	—	2·9	—	2·9
Rotundo Lying-in, Dublin	1862	127	—	—	—	35·7	—	—	1,156	7·0	—	7·0
	1861	127	—	—	—	58·6	—	—	1,668	1·4	—	1·4
Lying-in, Glasgow	1861-62	24	11	—	11	—	379	—	379	2·6	—	2·6
Lying-in, Liverpool	7 years	—	—	—	3	—	—	—	—	1·05	—	1·05
Margate Sea Bathing	—	250	—	—	—	—	—	—	—	—	—	—
Southport Convalescent	1862	135	—	—	—	62·5	—	—	1,299	—	—	·15

All Hospitals to which the Letter F is prefixed, admit fever cases either into the general wards, into special wards, or into a detached fever house.

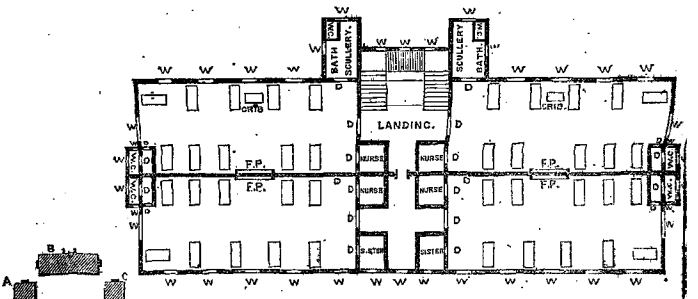
SUPPLEMENT.*

METROPOLITAN HOSPITALS.

ST. BARTHOLOMEW'S HOSPITAL is situated in the centre of London, and in one of its most crowded parts. It completely fulfils what to our minds ought to be the office of a general hospital, receiving at all times and without any distinction of persons any one who is sufficiently poor and sufficiently ill to become the subject of public charity in a hospital. The only exception to this rule is that cases of smallpox are sent away to the Small Pox Hospital.† The rule for admission is that ordinary cases are admitted as in-patients once a week, for which purpose applicants attend at the hospital, and after having been roughly sorted into physicians' and surgeons' patients, those whose ailments are less grave are made out-patients, and the rest are seen by the physician or surgeon of the week, and admittance given to them, if their cases seem to require it. On other days all the applicants are seen by the assistant (or out-patient) officers, except those whom the resident medical or surgical officer of the week thinks fit to send to bed.

The effect of this liberal reception of all classes of cases is seen in the returns of the patients admitted. The elaborate statistical tables prepared by Dr. Edwards may be used to show this fact. Our space will only permit us to cite some examples of the amount of acute disease received at the hospital. During the year 1862, 5911 patients were under treatment.‡ Of this number 279 were suffering from continued, typhus, and typhoid fever, and 49 died; 90 from scarlet fever, of whom 23 died; 11 from measles, of whom 3 died; 7 from diphtheria, of whom 5 died; 114 from erysipelas; 108 from cancer; 98 from pneumonia and pleuro-pneumonia; 44 from compound fracture; 149 from burns and scalds. In fact the hospital adequately ministers to the wants of a large, crowded, and poor population.

The hospital is composed of four separate buildings arranged around a central court, the angles of which are left open. Only 3 of these buildings are used for hospital purposes, the fourth being given up to the resident governing body and officers of the hospital. There is also a fifth building, in which some wards and the operating theatre are placed; and there is again a separate building, in which the resident medical officers house surgeons, &c.) and the resident pupils live, and which is termed the college. The whole stands on a large space of ground, and comprises an entire parish, the hospital chapel (which has lately been repaired and re-decorated, and made to correspond with the magnificence of the rest of the establishment,) being the parish church.



Block C.—Front.

A, B, C, Blocks of wards.
D, Offices, &c.

Block C enlarged; block B differ from A and C in the fact that each ward is longer by 8 feet, and contains an extra window.

* These reports or descriptions of individual hospitals are signed with the initials of one or both reporters, according as they were visited by one or both.

† It was found necessary for a portion of the year 1862 to exclude cases of typhus fever. This subject is discussed in another place.

‡ This includes 522 remaining in the house on Jan. 1.

The arrangement of the buildings which contain the wards is exceedingly simple and exceedingly good. Each rectangular block, as will be seen by the plan, is divided into two equal parts by a wide and very airy staircase, the massive oaken balustrades of which remind one of the length of time which has elapsed since the construction of the hospital. The present building was commenced in the year 1730. From the wide landing-places of these staircases the doors of the wards open on either side, with a large aperture (closed if necessary by a revolving shutter) over them, so that the ward shares freely in the ample ventilation of the staircase. So wide is this landing-place that there is room on either side of the ward-doors for a nurse's room on one side and a scullery on the other.

The wards are nearly all built on the same model. They are double, the entire ward, which occupies the whole depth of the building, being divided down its middle by a partition wall. This wall is complete, except at one end, where an aperture or doorway is left by which the two parts of the ward communicate at all times, there being no door. Thus the whole ward might be said to have four rows of beds, two on either side of a "spinal" wall. The wards are of ample proportions; the beds well removed from each other; some are as near as a distance of about four feet from the next bed; but the majority have a clear space of two and a half to three yards between them. They have curtains, but only round the heads of the beds. The wards appear to be perfectly pure, and free from hospital odour.

Four floors are used as wards; the only difference in the upper floor is that the outside walls slope slightly. No difference is perceived in the healthiness of different floors. The cubic space per bed is very large, being 1350—1365 feet in the three chief buildings and 1800 feet in the new part. The death rate for the years 1860, 1861, and 1862 was 10·7, 10·7, and 11·2 respectively. The deaths from what are usually classed as hospital diseases: viz., erysipelas, phagedæna, or hospital gangrene, and pyæmia (both admitted and contracted in hospital), were 13, 21, and 15 respectively.

The hospital contains 650 beds, but a few of these are in wards which are not always in use. At the time of our visit it appeared that there were 237 medical beds with 10 children's cots, and 217 medical patients; 361 surgical beds with 24 children's cots, and 340 surgical patients. Of the medical cases, 131 were classed as acute diseases, a large number being cases of scarlet, typhus, and typhoid fever, and acute rheumatism. Of the surgical cases, 68 were in the Lock wards, and will be spoken of separately. Of the 272 patients in the general surgical hospital, 106 were suffering from the direct result of injury, comprising 48 simple fractures, 8 compound fractures, and 10 burns; 69 were classed as acute surgical diseases, including the following operations of the selected classes:—viz., 1, amputation of the thigh for injury, and 1 for disease; 1, primary amputation of the leg; 1 amputation of the arm for injury, and 1 for disease; 1 amputation of the fore-arm for injury, and 1 for disease; 1 excision of the hip, and 1 of the knee; 2 operations for hernia, and 1 lithotomy. There were 2 cases of erysipelas, 13 of diffuse inflammation around wounds, and 1 of inflamed absorbents originating out of the hospital; 5 cases of erysipelas, 2 of diffuse cellular inflammation, and 2 of phagedæna, originating in the hospital. The remaining 72 cases were trivial or chronic. There were 142 open wounds or sores, out of these 272 patients.

With respect to surgical operations, the annexed list gives the number and result of the various amputations for three years 1860-1862 inclusive.

AMPUTATIONS OF LIMBS performed at ST BARTHOLOMEW'S HOSPITAL.

		No.	Died.
Traumatic Amputations	Primary:—		
	Shoulder Joint	1	—
	Arm	10	—
	Fore Arm	3	—
	Thigh	3	2
	Leg	6	4
	Secondary:—		
	Arm	2	—
	Thigh	3	1
	Leg	1	—
Other Amputations	Arm	8	—
	Fore Arm	1	—
	Thigh	34	6
	Leg	29	4
	Total	101	17

Of the small number of primary amputations the following died, not of the operations, but from injuries received at the time of the accident:—

1860.	Amputation of thigh.	Other injuries, suicidal, from jumping off Blackfriars Bridge.
1861.	"	"	Fractured ribs and pleurisy.
	"	leg.	Fracture of the pelvis.
	"	"	Fracture of other leg, and other injuries.

Of cases of lithotomy, and herniotomy we have also data for the years 1860, 1861, 1862. These give—

Lithotomy	-	31 cases	- 3 deaths.
Herniotomy	-	106 „	- 44 „

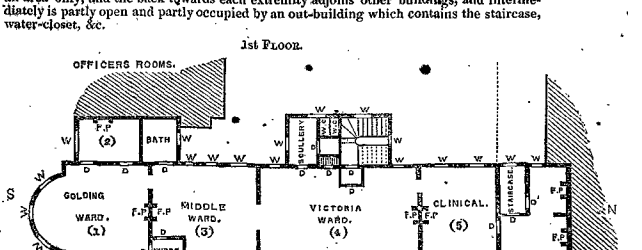
We may add that out of the 68 patients in the Lock wards there were four cases of diffuse inflammation, and 1 of phagedæna not originating in the hospital, and five cases of phagedæna which had broken out in the hospital.

The mean duration of treatment in the hospital of 20 cases of fracture of the leg was 40·1 days, and of fractured thigh 66·9 days. J. S. B. T. H.

THE CHARING CROSS HOSPITAL is situated in a densely populated part of London, is surrounded on all sides by houses, and has therefore few of those external advantages for ventilation which are generally considered important. It has no airing grounds whatever attached to it, so that patients needing exercise have to take it in the streets.

The hospital itself is a long narrow building, of which one extremity faces the Strand, the other is at present in part let out for shops. The front is separated from the street by an area only, and the back towards each extremity adjoins other buildings, and intermediately is partly open and partly occupied by an out-building which contains the staircase, water-closet, &c.

1st FLOOR.



Front. Entrance of Hospital under the *

Including basement and attic the hospital has five floors. Of these the first and second are devoted exclusively to the reception of patients, and the attic is occupied partly by the nurses' dormitories, and partly by special wards for children. The chief wards on both the first and second floors (four in number on each) form a linear series, and communicate so freely with one another as almost to constitute a single ward; and the several compartments (reckoning from south to north) contain (on the first or female floor) 11, 9, 15, and 9 beds respectively, and (on the second or male floor) 11, 7, 14, and 8. There is also on each floor a small private ward (holding in one case two and in the other three beds), situated to the side of the south ward; and upon the second floor there are further at the northern end two small wards for five and three beds each, which stand over a part of the building now let out for shops. On the attic floor the three rooms designed for patients are also in a linear series. Of these one shares with the operating theatre the centre of the building, holds 11 beds, and is appropriated to female children, the adjoining room contains 10 beds, and is used for the reception of boys, and the third room, which opens out of this, is a play-room. These wards communicate freely with one another like those on the lower floors.

The wards in this hospital are generally lofty and spacious, especially those on the first floor. The ward for boys and the play-room, however, are very low. The beds are for the most part about a yard apart, but here and there, from peculiarities in the shape of the wards, parts of them almost touch. The cubic space per bed varies; on the second floor it ranges from 760 to 1,800 feet, and in the largest ward on the first floor it is about 1,080. The windows, which are ordinary sash windows of good dimensions, and reaching nearly to the ceiling, are generally placed, though not symmetrically, on opposite sides of the wards. But in the end wards, which look upon the Strand, the windows are on contiguous sides, and in the ward for female children those on one side open into a corridor. To aid ventilation, the ceilings generally are provided with ventilators, which communicate with the external air; but these are supposed to have little effect. Open fire places and gas are used in the wards. It may be added, that there is on each floor a nurse's room, cut out, as it were, from one of the wards, and that on the children's floor a nurse's bedroom opens directly into one of the suite of rooms. Each floor has a bath-room attached to it and also a water-closet, the latter being well constructed, well drained, and separated from the wards by three doors, including, first, a scullery, and, second, a small lobby. The wards are scrubbed once or twice a week. The bedsteads are of iron; the mattresses horse-hair and flock.

METROPOLITAN HOSPITALS.

CHARING CROSS.

The nursing staff consists of nine day nurses and three night nurses, all of whom live in the house. In the treatment of wounds water-dressing is generally employed; in the cleansing, tow. Sponges are not used.

Ordinary patients are admitted weekly by governors' letters, but accident and urgent cases are received whenever they apply. In 1862, out of 950 admissions, 248 were obtained by letter, and 702 (including 224 accidents) without. The cases which are excluded are those of infectious and eruptive complaints, consumption, insanity, delirium tremens, fits, and syphilis. Some of these cases are, however, occasionally admitted.

The hospital contains 118 beds, of which 60 are designed for mates and 58 for females. There is no distinct separation of medical and surgical diseases (in fact the construction of the hospital does not admit of it); but on both the first and second floors one of the subdivisions is regarded as the accident ward. The average number of patients in the house was, during 1862, 98.

At the time of visit the hospital contained 107 patients, of whom 48 were medical and 59 surgical; 16 were in the children's wards. Of the 48 medical cases 21 were acute and the rest more or less chronic. Of the acute cases nine (including two of chorea) were trivial as regards danger to life; but 12 were more or less severe, and comprised several cases of acute rheumatism, a case of pleurisy, one of mania, and two of typhoid. Of the 27 chronic cases, 11 were cases of phthisis, bronchitis, heart disease, or affections of a serious character; the remainder were comparatively unimportant. Of the 59 surgical cases, 13 were accidents (including four simple fractures and two compound); 23 were acute, and 23 chronic. The cases comprised 26 with open wounds, four grave operations (all excisions), and five cases of erysipelas, and one of diffuse inflammation, none of which was contracted in the hospital.

No record of operations is kept, but it is stated that secondary surgical diseases are rare, and that they do not spread.

The cases admitted during the years 1860, 61, and 62, amounted to 857, 925, and 950 respectively; and the number of deaths and the death rate for each of these years were as follows: for 1860, 92 and 10·7; for 1861, 78 and 8·5; and for 1862, 75 and 7·8. Of the 950 cases admitted in 1862, 419 were medical and 531 surgical. In the absence of records kept in an available form, we can scarcely express an accurate opinion as to the character of the cases generally under treatment. They are probably much the same as those in other London hospitals, though certainly at the time of visit the surgical cases were, as a whole, less important and grave than one would have expected to find them. We have consulted the records of death, however, for several years past, and find that of the 75 deaths in 1862, 55 were in medical cases and 20 in surgical. Of the medical deaths, one was that of a patient brought in dead, one was due to typhoid, two to typhus, and one to fever (?), one to scarlet fever, and two to scarlatinal dropsy. Apoplexy numbered two victims, and brain disease five. Phthisis destroyed nine lives; and renal, heart, and kidney diseases 17 others. The remaining fourteen were produced by various diseases, which need not be enumerated. The 20 surgical deaths comprise six of persons who were dead on admission, and nine of persons who died from the effects of accidents, such as fractures, burns, and the like. Of the five deaths which remain, one was due to "low fever" after operation, one to "exhaustion" after excision of the ankle, and the others severally to abscess, diseased bladder, and erysipelas. In the year 1861, again, out of 78 deaths, 10 were in persons dead on admission, and of the remainder, 50 were medical and 18 surgical. The medical deaths were much of the same character as those in 1862, and included 10 from phthisis. Of the surgical deaths, 10 were the result of accident (including four burns), one was dependent on gangrene after amputation, one on "typhoid" after operation, and one was a case of strangulated hernia. In 1860 we observe three deaths from hernia, one after lithotomy, two after amputation (one at the hip, and one of the thigh, for disease), and three from pyæmia, but whether or not contracted in the hospital is not stated. In 1859 there were two deaths from tetanus, three after operation for strangulated hernia, three from pyæmia (one after injury to the head and one after operation for fistula), one from erysipelas, one from gangrene after fractured thigh, and one from diffuse cellular inflammation after lithotomy in an old man of 74. In 1858 the total number of deaths amounted to 94, and included, early in the year, one death from pyæmia, after excision of hip, and one from erysipelas, after excision of a metacarpal bone. A little subsequently there was another death from erysipelas; and from August to December (inclusive), and in the following order, there were (all on the male floor) a death from compound fracture of the leg, where amputation was performed and gangrene followed, three deaths from erysipelas, one from inflammation of the leg, one after amputation of the leg, a death from pyæmia after operation for fistula in ano, and one after amputation for compound fracture. In the current year there have been one death from pyæmia, after amputation of the thigh, and one death from sloughing phagedæna.

It would appear from the above statistics that the hospital contains, habitually, a larger number of surgical than of medical cases (in the proportion during 1862 of 5 to 4); but that the chief mortality is due to the medical section of the hospital; for, to take the same year (1862) for analysis, we find that the mortality of medical cases was 13·1 per cent.; the surgical mortality (excluding the cases brought dead to the hospital) no higher than 2·6 per cent. If, further, we divide the cases of accident (224 in number) from the rest, and distinguish their mortality from that occurring among the other surgical cases, we find that the death rate of the former was 4·, while that of the latter becomes reduced to 1·6. It is clear, therefore, that the surgical mortality is really very low, and it is probable that the proportion of serious surgical cases is not large; but it is obvious that

pyæmia and erysipelas occasionally occur in this hospital, and occasionally carry off operation cases. As regards medical practice, there is little specially to remark. It seems that on the whole the cases are much the same as those in other London hospitals, and that the results differ in no important degree. Small-pox, however, has spread in the wards; and last year some seven or eight cases of typhoid fever occurred all about the same time; but it is supposed that the disease had been contracted outside prior to admission. The hospital itself struck us as being exceedingly clean, and well conducted, well ventilated, and well suited to hospital purposes. But it may be a question whether the plan (here, perhaps, unavoidable,) of having all wards in one, and having no well separated room for the reception of infectious and other dangerous cases, is not fraught with some degree of danger.*

J. S. B. T. H.

ST. GEORGE'S.

ST. GEORGE'S HOSPITAL is one of the largest of the "unendowed" hospitals of London; that is to say, the hospitals which depend for their support in great part upon the casual liberality of the subscribers, and which in return confer certain privileges upon those subscribers in recommending the patients of the hospital. It is to be remembered, however, that in London these privileges are far less strictly enforced than in the country, and are also greatly modified by the circumstances of the hospital. Thus, if the reader will turn to the summary of the London Hospital or of King's College Hospital, he will see how greatly the peculiar circumstances of those two institutions modify the numbers admitted by letter and without letters. St. George's Hospital differs in its position and circumstances from both these hospitals, being situated in a part of the town where accidents are less common than at the London Hospital, besides that there are other hospitals (St. Mary's on one side and the Westminster on the other) at no great distance, and being less cramped for room than King's College. On the other hand, as compared with the London Hospital, it attracts a greater number of acute medical cases, by admitting all fevers, except small-pox. On the whole, the number of patients admitted without letters bears a large proportion to the total, though not so large as in the hospitals above referred to. At St. George's the number of free admissions is, roughly speaking, a third of the whole, the numbers being in nine years 10,274 without and 24,884 with letters.† No separation of disease is practised at this hospital. Cases of common and exanthematous fevers are put about among the ordinary patients, and no inconvenience or danger follows from the practice, except that a few cases have occurred in which scarlet fever and one or two in which typhus has attacked single patients in wards in which such diseases have been under treatment at the time. In some of these cases the disease might possibly have been latent at the time of admission. The exact number of cases we are unable to give, but they are not thought to exceed in number one in a year, and are probably even less numerous. A gentleman who has had an opportunity of watching minutely every medical case, as resident assistant apothecary, for three years and a half, informs us that he can remember only one case of typhus communicated from one patient to another in the next bed. Another instance is remembered in which two patients had scarlet fever after the admission into the ward of a doubtful case of scarlet fever. Nothing like an outbreak of fever has ever been seen in the house. A case of small-pox was accidentally admitted in the year 1862, and was kept for several days in the house. This was followed by the appearance of a considerable number (more than 20 in all) in various parts of the house.

But it ought to be mentioned that certain precautions are taken. No case of typhoid, typhus, or scarlet fever, measles, or in fact any disease, except small-pox, has ever been refused at this hospital; but care is always taken to put the cases as far away from each other as possible, and never to put any cases in the central wards, which, opening as they do out of the corridor, and having no thorough ventilation, are doubtless less adapted for the treatment of acute cases than the other wards.

The medical and surgical cases are placed in distinct wards, and cases of diseases of the urino-genitary organs and of the eye are as much as possible placed in certain wards, not, however, by themselves. There is a separate ward for uterine diseases. There are also three rooms, in various parts of the house, occasionally used as separate wards or chambers, for offensive and other special cases.

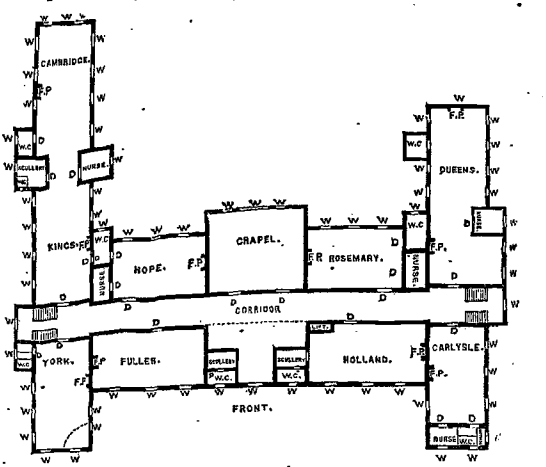
The situation of the hospital is at the west end of Piccadilly, in an elevated and open part of the town, and fronting towards Hyde Park on one side and the Green Park on the other, but standing in the line of the street and contiguous to the houses. It has no exercising grounds, except a small gravelled courtyard, in which males and females are allowed to walk at different times in the day.

The building is of recent date (1834), though the foundation dates from more than a century. It is in the H shape, but an addition has been made to one side of one of the

* While these sheets are going through the press, an outbreak of typhus has taken place in this hospital. A female was admitted with the disease (out of charity and contrary to rule) on the 23d of March, and died on the 10th of April. About eight days after the death of this patient, the nurse of the male ward (who had had no communication with her) was attacked with typhus, and the disease spread through the male wards. The nurse is convalescent, 3 or 4 patients have died, the rest have been turned out, and the hospital has been cleared, for thorough cleansing. The hospital was not previously in a dirty condition. April 20th, 1864.

† Annual Report for 1861.

limbs of the H, as will be seen in the annexed plan. The cross limb of the H is occupied on the ground floor by the necessary offices and by the out-patient department,* and



ST. GEORGE'S HOSPITAL.—1st Floor.

on the first and second floor by four wards placed on either side of a corridor, with a chapel on the former, and an operating theatre on the latter floor. The wings or vertical limbs of the H are each occupied by two wards on each of the three floors, and in the prolonged side these wards are double in length, one compartment opening out of the other, as seen in the plan. A third story has lately been added, containing a convalescent ward for males and females, and bed-rooms for nurses. We obtained the mean number of patients in both convalescent wards, for seven days, and found it to be 50. That is to say about one patient in seven is thus withdrawn from the general wards. There are two staircases at the points of junction of the central and vertical parts. There are also lifts for the conveyance of coals and food, and one recently erected for the conveyance of patients in bed from the basement to the second floor. In the basement, besides the various necessary offices, kitchen, shop, bathroom, &c., and besides the premises necessary for clinical medical instruction, museum, and lecture-room,† there is a surgical ward, which is regarded as a semi-convalescent ward; that is to say, the milder cases are generally placed in it.

There are 21 wards (counting each double ward as one), and of these the 12 principal and largest wards are ventilated by opposite windows, at least in the greatest part of their extent. These windows are broad, and extend up to within two or three feet of the ceilings. In the old part of the hospital they are sash windows; in the additional parts they are in three compartments, opening inwards. In the smaller wards there are windows on one side only. Besides the windows, doors, and fireplace there are some means of extra ventilation in some of the wards. This is effected by means of a single shaft into the roof, communicating with the long wards of one side (the male) and by several shafts into the roof communicating with the long wards of the opposite (female) side. The other wards have merely Arnott's valves in the chimneys. The beds are placed in pairs between the adjacent windows, and are three feet apart from the nearer and four feet from the farther of the two contiguous beds. The entire cubic space is about 1200 feet per bed.

The water-closets are situated in *sculleries* which open out of the wards. They are self-acting, and provided also with self-acting windows, so as to be kept continually ventilated.

The mattresses are of horsehair, and are sent away to be cleansed after a fever or an offensive case.

* This is a confessedly bad arrangement, and the result of an oversight in the original plan.
† The anatomical school is not in the same premises as the hospital, but at a distance of a quarter of a mile.

The hospital contained at the time of our visit altogether 345 beds; of which 141 were medical, and 204 surgical, including 11 children's cribs. This inequality in the number of the medical beds is partially remedied in practice by the more rapid change in the medical cases; so that the number of medical cases admitted during the year 1862 was 1770, of which the average duration in hospital was 24·37 days, and the rate of mortality 11·682 per cent. The number of surgical cases during the year was 2257.* The average stay in hospital 30·49 days, and their rate of mortality only 6·453 per cent. The rate of mortality over all the cases was 8·779 per cent. The average daily number of patients was 307.

As to the results of practice at this hospital, it does not appear that it owes to its certainly superior situation any immunity from the secondary diseases which beset all our large hospitals for acute cases. There is an idea which still prevails, founded on something once said by a great surgical author, and intended to apply to the old hospital, that erysipelas is peculiarly rife at St. George's. This is altogether the reverse of the fact. Cases of erysipelas occur comparatively rarely, and then only in a sporadic way, and in a very mild form. A death caused by erysipelas originating in the hospital is very rare, though of course patients who are dying from other causes may have erysipelas; and, again, diffuse inflammation occurring as a complication of extensive injuries may prove fatal. But though erysipelas has been rare, there is no question that phagedæna has often visited this hospital severely. It is quite true that each time it has done so (and there have been three outbreaks within the last 10 years, the last of which has hardly yet subsided), the disease has also been very rife in the neighbourhood, and that more patients have been admitted with the disease than have contracted the disease in the hospital.† It is also true that the affection has been usually of a comparative mild type, and has seldom led to fatal results; still the fact that phagedæna is, to say the least of it, quite as rife at St. George's Hospital as at Guy's or St. Bartholomew's, shows that the advantages of a superior site are very trifling, and liable to be neutralized by very slight causes.

We subjoin a list of the operations of the classes selected for comparison:

OPERATIONS at ST. GEORGE'S HOSPITAL during Three Years 1860–1862 inclusive.

	No.	Died.
Amputation of the thigh for injury	2	1
" " disease	20	5
" leg for injury	3	1
" " disease	19	3
" arm for injury	2	1
" " disease	4	0
" fore-arm for injury	10	2
" " disease	4	0
	64	13
Excisions of the knee	2	1 amputated.‡
" elbow	2	1 amputated.
Hernia	48	19
Lithotomy, adults	5	2§
" children	5	0

We have also examined the list of deaths during the year 1862. The cases may be thus arranged:—

Medical	Acute medical affections	89
	Visceral and chronic medical affections	88
	Internal cancers and tumours	15
		192
Surgical	Direct result of injury	68
	Surgical operations	16
	Acute surgical affections	26
	Chronic surgical affections	12
	Cancers and tumours	5
		127
		319

* If the cases had been in proportion to the number of beds, this latter number would have been 2546.

† Thus in the present outbreak there have been up to the end of the year 1863 altogether 92 in and out patients affected with phagedæna. Of the whole number of cases, only 19 originated in the hospital, 40 were admitted into the house with the disease; 33 were treated as out-patients. The numbers are to be depended on as far as in-patients are concerned, but among the out-patients there is little doubt that a few slight cases have escaped enumeration, so that the total is rather lower, and the ratio of cases originating in the hospital to those admitted with the disease rather higher than it ought to be. See a paper by Mr. Pick, house surgeon to the hospital, in the British Medical Journal, March 5, 1864. We may remark that this outbreak of phagedæna had no perceptive effect on the death-rate, which was lower in 1863 than in 1862,—viz., 8·324 per cent.

‡ And died soon after leaving the hospital of phthisis.

§ Lithotrity is comparatively common at this hospital.

APPENDIX.

No. 15.
The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.

METROPOLITAN HOSPITALS.

The great majority of cases were examined after death, and the notes and history of the cases carefully preserved in a volume devoted to that purpose. Such volumes have been kept for more than 20 years. Pyæmia existed in 7 cases.

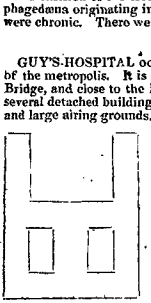
The day which we selected for noting down the cases in the hospital happened to be an unfavourable one, both because the annual whitewashing kept some wards vacant, and because the prevalence of phagedæna in the hospital and its neighbourhood kept the number of operations low.

There were 101 medical patients, of whom 55 were labouring under acute diseases. There were 156 surgical patients; 35 accidents, comprising 14 simple fractures, 2 compound fractures, and 3 burns; 63 acute surgical cases, comprising, in the classes of operation selected for comparison, 1 amputation of the leg, 1 amputation of the ankle, and 1 excision of the elbow; 1 case of erysipelas originating in the hospital; 3 cases of phagedæna originating in, and 8 cases originating out of the hospital. The other 58 cases were chronic. There were 72 cases of open wound and sore.

J. S. B. T. H.

GUY'S.

GUY'S HOSPITAL occupies about 7 acres of ground in one of the most central parts of the metropolis. It is situated in the borough of Southwark, near the foot of London Bridge, and close to the London Bridge Railway Termini. It comprises two chief blocks, several detached buildings, which are appropriated to special purposes, school buildings, and large airing grounds.



The old building, erected 140 years ago, is of the form shown in the annexed plan, and has 3 floors, exclusive of attic and basement. The whole of that part of it (3 sides of a parallelogram) which bounds the front square is appropriated to resident officers apartments, to the superintendent's and other offices. The part behind this is, with the exception of some portions of the ground floor, devoted exclusively to the reception of patients, and contains 13 wards, with 334 beds (inclusive of 16 cribs). One of the wards contains 14 beds, but the rest hold between 23 and 34. Two of the wards are on the ground floor, and are specially intended for male accident cases; two are in the attics (a male and female syphilitic); and the rest occupy the first and second floors. The wards are all of them *long* wards, in some cases occupying one side of the square only, in others two sides, or one side and a portion of another, and hence under those latter circumstances, consisting of two portions, placed at right angles to one another. They are all of them fairly lofty and wide, and have abundance of windows on both sides, which reach nearly to the ceiling, open by ordinary sashes, but have two of their upper panes detached from the framework, so as to form a hopper-mouthed ventilator. The wards are provided also with ventilators in the ceiling, over the gas burners, and are heated solely by open fire places. The beds are widely separated, generally about 2 yards apart, and most of them so situated that each one has appropriated to it the entire space between two windows. The form of the wards, however, and in places the arrangement of the windows, prevent this plan from being carried out uniformly. The space allowed to each bed is about 1,600 cubic feet. Each ward has a nurse's room leading out of it, and a watercloset and scullery, separated from the ward by a lobby.

The new building (Hunt's) forms an imposing oblong block in the rear of that which has been just described. It comprises four floors, of which the ground floor contains the out-patient department, and the other three floors contain the wards. One end of the block is occupied by a very spacious staircase, out of which the wards open. The wards on the different floors are the exact counterpart of one another, and correspond in almost every particular to those in the wings of the London Hospital, on the plan of which (only on a more magnificent scale) they were in fact constructed. Each ward consists of five compartments, four of which are arranged in pairs side by side; while the fifth is placed in the centre of the building transversely, so as to intervene completely between each pair. This last is the dining and day room, and communicates by a doorway with each of the other four divisions, which are the sleeping apartments for the patients. Each division containing beds has six large windows on one side, and on the opposite side a fire-place in the centre, with an open window-space over it, communicating with the adjoining compartment, and two doors, one towards each end, also allowing of free communication. Then, in addition to the doorway at one end leading to the dining room, there is at the opposite end of each of those divisions which open on the staircase a door and two windows, and at the opposite end of each remaining division a large central window. The sister's rooms, the bath room, and the scullery are placed in the four corners of the dining room. There are four water-closets, one to each division, separated from the ward by a lobby. The wards are lofty and clean; there is a space of about two yards between the beds (those along the outer walls alternating with the windows), and a cubical allowance to each bed of about 2,000 feet. Each entire ward contains 50 beds, all of which are for medical patients. The wards are heated in part by open fire-places; but there is also a very elaborate system of artificial ventilation and warming. Warmed air is admitted in cold weather, through orifices in the upper part of the walls on one side, and the vitiated air is removed by orifices in the lower part of the opposite wall. These latter communicate with passages leading to a lofty shaft, which carries off, with the foul air thus reaching it, the smoke, from the various fire-places in the building. The system is extremely ingenious, but has been condemned

unanimously by the medical staff, who find it utterly inefficient, and who regard these wards as the least healthy in the hospital; and, indeed, certain structural alterations have had to be made, such as increasing the elevation of the doorways between wards, and the making of windows into the passages, in order to permit of a freer circulation of air; and it has been found necessary to look for ventilation, as in the other English hospitals, not to the artificial system, but to the opening of windows.

Of the detached buildings, one contains two eye wards, with 14 beds each; one (Petersham) contains three wards, of which one (with a single bed) is a separation room, one is a ward for male surgical cases (chiefly operations), and has 10 beds, and one is a similar ward for females, with 10 beds and five cribs. The third detached building contains the two medical clinical wards, which are taken charge of by the physicians in rotation, and contain always selected medical cases. They are both on the ground floor, are the exact counterpart of one another, and contain 17 male and 18 female beds respectively. In the same building are contained rooms for clinical clerks and for chemical analysis. These wards were originally designed and used for the treatment of lunatic patients, but have for some years past been appropriated to their present purpose. Without perhaps being models of what wards should be, they are without doubt two of the most cheerful, well-lighted, and comfortable wards we have ever seen. The general form of each ward is that of a long oblong, with a projecting bow at each end. The vertical section shows that the ceiling is formed of three horizontal portions, of which the central portion is considerably loftier than the lateral portions, and is separated from them by vertical walls, which are supported on iron columns. There are numerous windows on each side, both in the lower wall and in that which unites the two ceilings. The windows in the latter situation are small, but the others are large, rounded at the top, and extend from the ceiling to the floor. There are windows also in one of the bows, and in the other bow three doors. Wire blinds are placed in front of the lower part of each window. The beds are wide apart, as in all the other wards of this hospital, and for the most part alternate with the windows. There are two fire-places, back to back, in the centre of each ward, from which a flue ascends, and finds its exit through the centre of the ceiling. A water-closet opens out of one side of each ward in a position corresponding to a window on the opposite side, and this is perhaps the most defective point in connection with these wards. The nurse's room and bath-room are all conveniently arranged in the interval which separates the wards.

As regards the general arrangements of the hospital, we may mention that the water-closets (which are all well drained) are of two kinds, self-acting closets, and ordinary closets with plugs. The latter are preferred. There are baths conveniently placed throughout the building. The water supply is extremely good. There is an artesian well on the premises. The wards are scrubbed twice a week by scrubbers, and the hospital itself is thoroughly cleansed and whitewashed once a year. The bedsteads are of iron, with curtains at the head. The mattresses are flock. They are changed whenever they are dirty.

The nursing staff comprises 19 sisters, 28 day nurses, and an equal number of night nurses, exclusive of scrubbers. A sister is attached to each large ward.

The treatment, on the whole, is of a stimulating and "feeding" character. Simple-water dressing is used, poultices gradually falling into disuse. Sponges (according to rule, at least,) are not employed in cleansing wounds.

No letter of admission is required. All urgent cases and accidents are admitted whenever they apply; but less severe cases are expected to present themselves on admission day (Wednesday). There is no particular class of persons admitted; the patients comprise the London labouring poor of all kinds, and a fair proportion of persons from the country who arrive by railway. A very large proportion of cases comes from the south and from the east of London.

580 beds can be made up in the hospital, but habitually not more than 520 or 530 are in use. At the time of our visit there were 22 wards (one a side ward) in use, containing 574 beds; of these, 350 were surgical beds and 224 were medical. It should be added that there are two or three other side wards, which doubtless raise the number of beds to 580. The medical and surgical cases are separated; there are also male accident wards, male and female venereal wards, and eye-wards; further, two compartments in one of the new wards are given up to the treatment of diseases of females; and there are finally the medical clinical wards. Noisy and dangerous cases are isolated.

The patients in hospital amounted to 531, of whom 50 were syphilitic, 24 were suffering from eye-diseases, 24 were labouring under diseases peculiar to women, and of the remainder 243 were ordinary surgical cases and 190 ordinary medical cases.

Of the 190 medical cases (excluding cases of diseases peculiar to women), 46 were acute and 144 chronic. Out of the former, 36 were grave cases, including six cases of typhus, three of typhoid, four of scarlet fever, four of erysipelas, and 14 of acute rheumatism, besides two or three cases of such diseases as pneumonia hæmoptysis, &c. Of the chronic cases, 86 were cases more or less dangerous to life, such as phthisis, Bright's disease, renal disease, ascites, chronic bronchitis, and the like.

Of the 50 cases in the venereal wards, 16 were acute and 34 were chronic. There were four cases of phagedæna. Of the 243 ordinary surgical cases, 97 were cases of accident, 19 were cases of acute disease, and 67 were chronic cases. There were 126 open wounds. Among the above cases were included 41 simple fractures, nine compound fractures, and 13 burns; 10 cases of operations, of the classes selected, (viz., four cases of lithotomy, two amputations of the thigh, three amputations of the leg, and one herniotomy); two cases of diffuse inflammation, one of erysipelas, and one of pyæmia

which had originated in the wards, and one case of diffuse inflammation, in which the patient had been admitted with the disease.

In the year 1862, 4,888 cases were admitted into the hospital, of whom 468 died. 2,000 of these cases were medical, and of these 292 died, and 2,888 were surgical, of whom 176 died. The per-centage of deaths over all cases was 9·61, over medical cases 14·49, and over surgical cases 6·16. The average daily number of patients in the house was 494, and the average stay of each patient in the hospital was between 33 and 34 days. The following table shows the classes of disease admitted, and the number of deaths in each:

	No.	Died.
1. Nervous system	360	36
2. Respiratory organs	386	107
3. Organs of circulation	176	53
4. Digestive organs	305	52
5. Genito-urinary organs	505	43
6. Venereal diseases	451	4
7. Dropsies	180	38
8. Diseases and injuries of bones	537	48
9. Diseases and injuries of joints	467	6
10. External injuries of soft parts	289	34
11. Abscesses, ulcers, tumours	492	16
12. Diseases of the eye	395	—
13. Diseases of the skin	146	4
14. Fevers	164	24
15. Miscellaneous affections	86	3
Total	4,869	468

Of the medical cases, 8 were admitted with and 5 died of apoplexy; 108 had bronchitis, and 18 died; 181 were admitted with phthisis, and 63 died of it; 82 had heart disease, and 43 died; 37 had hepatic disease or injury, and 18 died; 18 had renal disease, and 7 died; and 171 had dropsy (renal, cardiac, or hepatic), and of these 82 died; of the fever cases 55 (with 16 deaths) were cases of typhus, and 43 (with 6 deaths) were cases of typhoid. Of the 2,888 surgical cases 810 were cases of accident, and of these 73 (or 9 per cent.) died, 24 of the deaths being due to burns; 451 were venereal cases, of which 4 (or ·88 per cent.) died; and 395 were cases of eye disease, among which no fatal cases occurred; 42 cases of hernia, and 28 of vesical calculus were under treatment.

The following are the chief operations (belonging to the classes selected by us for comparison) performed during the years 1861 and 1862.

	No.	Died.
Amputation of thigh for injury	10	6
" " disease	15	6
" leg and foot, for injury	11	3
" " " disease	20	1
" arm, for injury	8	3
" " disease	3	1
" forearm, for disease	3	1
" excision, elbow	3	—
" " hip	1	—
" lithotomy	31	3
" herniotomy	41	21

Phagedæna and erysipelas and pyæmia occasionally occur, and the former have at times spread. In the report for 1862 only 2 deaths from pyæmia after operation are noted. The hospital is regarded as a healthy one. An interesting fact bearing on the question of the salubrity of the new wards is alluded to by Dr. Steele, in his report (previously quoted). In February 1862, 7 cases of typhus broke out rather suddenly in one of them. There was a bad case of glanders in the ward at the time, and one of putrid sore throat, which rendered the atmosphere of the ward offensive, and there had been 3 weeks previously a case of mild typhus. Two patients were first attacked simultaneously (of whom one had been in a month, and was suffering from diabetes, and one had been in still longer, and was labouring under acute rheumatism). Five other cases occurred within a short time, and 2 deaths resulted. Of 13 nurses and assistants tending the typhus patients during the year 1862, 4 fell victims to the disease.

It seems almost needless to state, that this fine hospital amply fulfils all the functions which a hospital is needed to fulfil, that its older wards are excellently constructed, and admirable as regards cheerfulness and ventilation, and that the new building is also a very noble pile. With regard to this last we share the impression of the medical officers, that its ventilation is imperfect; and we cannot but think too that the large space devoted on each floor to the purpose of a patients' dining-room is almost uselessly bestowed; and indeed we gathered that the presence of these dining rooms tends to withdraw nurses from their proper places and proper duties in the wards.

J. S. B. T. H.

KING'S COLLEGE HOSPITAL is situated in one of the most crowded parts of London, and in one of its poorest neighbourhoods. It has no airing or exercise grounds connected with it*, but, as will be seen by the block plan annexed, is closely surrounded by streets and houses. It is a recent institution, having been founded in 1839, when the disused workhouse of St. Clement Danes was fitted up as a hospital in connexion with the medical school of King's College. In 1852 the foundation stone of the present hospital was laid; portions were opened in 1855 and 1861, and a small part still remains to be built. The last vestige of the old workhouse was removed in the early part of 1863.†

It must be remembered that the hospital, besides being a very recent, is at present a very poor institution; and that the money necessary for the building and for the current expenses is only procured with considerable difficulty by the active exertions of the supporters of the charity. It must also be remembered that it is in connexion with a large and distinguished medical school, and that many surgical operations are performed here. The letter system of admission is in operation here, but not fully, as will be seen by a reference to the report for 1861, p. 17, where it appears that out of a total number of 19,176 persons admitted into the hospital up to the year 1855 inclusive, only 6,107 had been admitted by letter. Of the acute diseases only small-pox is excluded; whilst, of the chronic, confirmed consumption, old ulcers, and syphilis in females are excluded. The number of beds at the period of our visit was 147, of which 10 were set apart for midwifery, for this hospital presents the peculiarity for a London hospital of giving a portion of its space to accouchements. Such are the chief points worthy of notice in the regulations of the hospital; and it is clear that the combined effect of all of them is to increase the proportion of urgent cases. The cramped resources of the hospital forbid the practice so common in large rich hospitals of taking cases into the house out of charity. The requirements of the school and the celebrity of its officers increase the number of urgent and dangerous cases; the hospital seems to have freed itself, partially at any rate, from the necessity of admitting cases, not because otherwise they are likely to die, or because they are curable, but because they bring a recommendation; the acute and febrile diseases, so prevalent in low neighbourhoods of our large cities, are freely received; and the small number of beds ensures a careful selection and rapid change of cases.‡

The construction and plan of the building is tolerably well known to all who take an interest in such matters, both by the laudatory description of Dr. Guy and the adverse criticism of Miss Nightingale. We subjoin the description which Dr. Guy has given of it.

"The building is in the Italian style, of yellow brick and Port and stone, erected on foundations of concrete over gravel. The ground slopes rapidly towards the Thames, so as not only to admit of the most perfect drainage, but to place the basement story of the building on a level with the new thoroughfare, which is to skirt the building on the south. The parts of the building which require to be drained are so placed that no drain traverses the body of the building. The drains themselves are of glazed earthenware imbedded in cement.

"The staircases are all of stone, and the floors of concrete on iron joists. The building is therefore fireproof. The walls are lined with Parian cement. The water supplied to the building is lifted to the upper story by a small steam-engine, and the fall of a part of it actuates the hydraulic lifts.

"Supplies of hot and cold water circulate throughout the building; and the operating theatre, the chapel, and a few small rooms attached to the out-patient department, are warmed by coils of the hot-water pipes. The great staircase and all the other apartments of the building are warmed by open fireplaces. The building consists of three principal blocks—a southern block, and an eastern block. The southern block has two large waiting-rooms for out-patients on the basement story, thirteen rooms for the service of the out-patients on the ground floor, and an operating theatre and chapel on the first floor. The operating theatre, which is also the clinical lecture-room, has a small waiting-room attached to it, and the chapel has a small vestry.

"The out-patient department communicates with the eastern block in which the dispensary is situate, by a structure of one story, which is also the exit-hall for out-patients; it communicates with the northern block of the building by two corridors eight feet wide, out of one of which, on the ground story, the post-mortem theatre with the dead-house opens. A winding staircase of iron establishes a communication between the out-patient department and the operating theatre, and broad open staircases, also of iron, connect the waiting-rooms on the basement with the rooms on the ground floor.

"The northern block, in the centre of which is the principal entrance, contains on the basement-floor the residence and stores of the steward and lady superintendent, with rooms for servants; on the ground flow the board-room, secretary's office and living rooms, two rooms for medical officers, and one for medical pupils, and a waiting-room, surgery, and bath-room, for urgent cases and in-patients prior to admission to the wards. An entrance-hall in the centre leads, by a corridor to the left, into the great staircase, and by one to the right to the nursing department. The first, second, and third stories contain spacious wards, in groups of four, and at the western end the residences of the lady superintendent and lady nurses. The roof story contains a sitting-room, and twelve sleeping-rooms for nurses.

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* The patients who are able to walk have leave given them to go into the town.

† Many of the facts concerning King's College Hospital are taken from papers by Dr. Guy, one of the physicians.

‡ It should perhaps be added, that there is a dispensary in the neighbourhood, which is affiliated to the hospital.

"The eastern block has in the basement a number of spacious living rooms, and in the roof-story a large dormitory, both for nurses. The *ground-floor* contains one accident ward for thirteen beds, the dispensary, and three rooms for officers; and the first, second, and third floors have each three double wards.

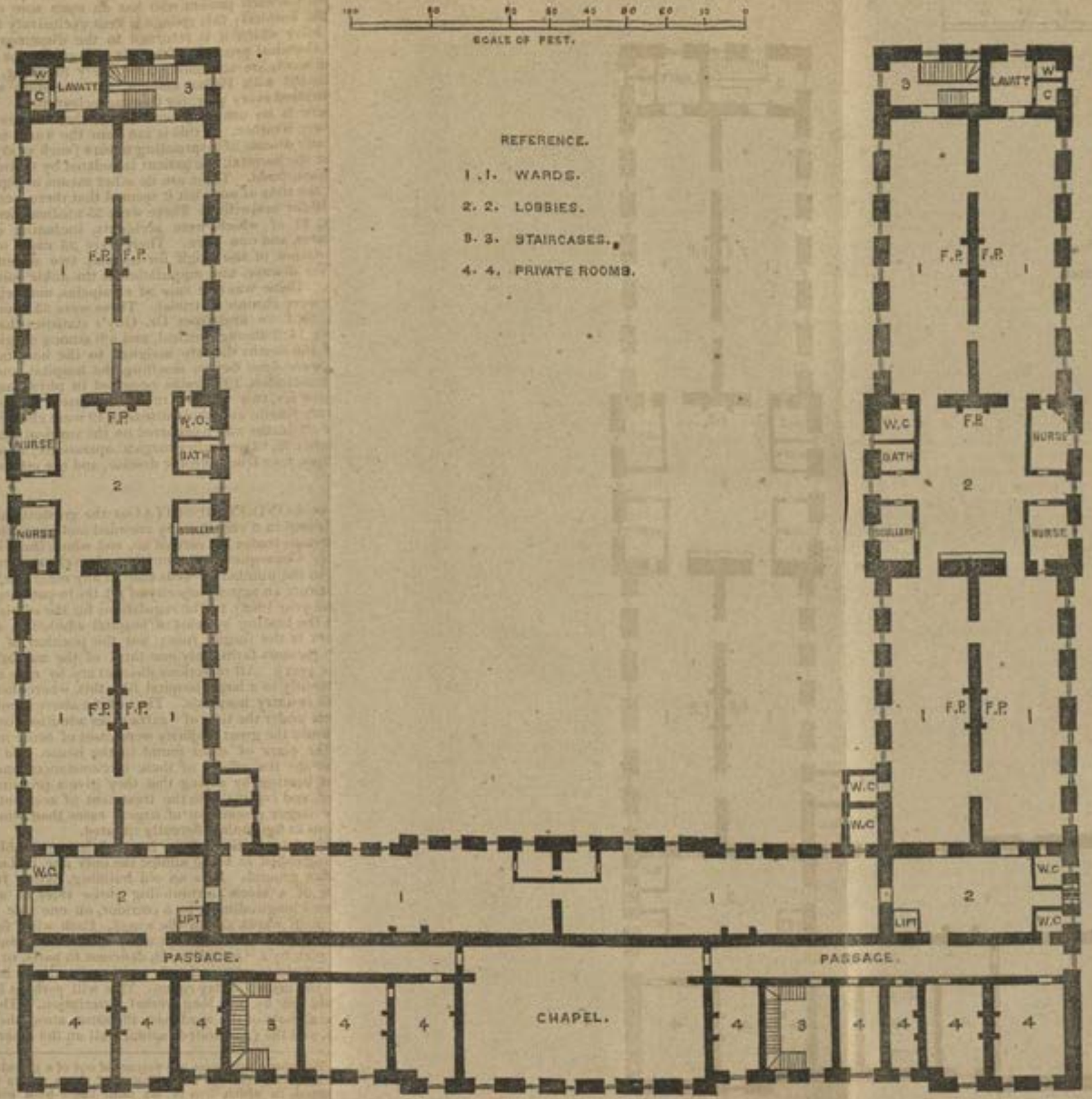
"The centre of the building is occupied by a staircase of unequalled dimensions. It is 63 feet high, 44 feet broad, and 31½ feet wide, and its cubic contents amount to 87,318 feet. Beneath it is the kitchen; above it, the entrance to the nurses' dormitories in the north and west wings, with lavatories and water-closets; and attached to it are two large lifts, by which provisions, diets, coals, and patients are hoisted, and the cinders, dust, and refuse lowered. These lifts, which run from the basement to the upper story, are situate in recesses at the entrance of the principal wards of the northern block; they are furnished with windows on each landing, and are moved by water-power; on the basement, the kitchen, the scullery, the steward's stores, and the coal-store, are close to these lifts; on the ground *floor*, the three rooms for the reception of urgent cases and in-patients lead up to them; and in the remaining floors the moveable receptacles for dust, cinders, and refuse connected with the groups of four wards are quite near to them. It is scarcely possible to imagine an improvement in the position of these lifts, or in the relation which they bear to the parts of the hospital that ought to be in connection *with them*. The wards, both of the northern and of the eastern wings, communicate directly with the great staircase, and, by means of swing windows over their doors, may receive air directly from it. At night, when the windows of the wards are shut, this addition of nearly 90,000 cubic feet of air is important. The staircase, lighted by 24 large windows, which can be opened at pleasure, becomes a source of light and air to the whole building, of which it is the centre. In winter, the air of the staircase, already tempered by the warmth of the kitchen beneath it, is warmed by two open fireplaces.

"The wards occupy the first, second, and third floors of the eastern and northern blocks; and there is one ward for accidents on the ground floor of the first-named block. In common with other parts of the building, their walls are of Parian cement, and their floors of wood, on fireproof constructions of iron and concrete (Fox and Barrett's patent). In the eastern block there are three double wards; in the northern block, three groups of four wards each. One of the four wards in the northern block is at present used as a day-room, and contains a convenient covered bath and covered lavatory and scullery, with supply of hot and cold water, larders for butter and milk, and boxes for dust and cinders; also cupboards for crockery and for linen. Each double ward in the western block has two water-closets, one bath-room, and one scullery. Each group of four wards in the northern block has two water-closets at either end, in which, as in the water-closets attached to the other wards, the supply of water is regulated by the opening and shutting of the doors. The wards are either 14 or 15 feet high; those in the eastern block are 24 feet wide and 70 feet long; the large wards in the northern block are 85 feet long, and of the same width; *the three* small wards which open into them are squares of 24 feet.

"All the wards are warmed by open fires, and ventilated by opposite windows both in their length and in their width. The spinal wall which divides the wards is perforated opposite the windows, and the wards communicate at either end by wide archways. The windows are wide and lofty, and nearly reach the ceiling, and they open by three sections, of which the upper section in every instance is tilted inwards. In some of the windows all the sections are tilted in this way.

"In width, the windows bear to the solid wall the large proportion of four to five, which ensures to every part of the ward a perfect light. The head of each bed is placed in a pier between two windows, or, opposite to these, against the spinal wall, between two openings. The wards, and the arrangement of the beds within them, present a perfect symmetry. In the eastern block the space between the beds is seven feet from side to side, and 11 feet from end to end. In the northern block the space from side to side is somewhat greater. In the eastern block the cubic space per bed is either 1,809 or 1,937 feet, according to the height of the ward; in the northern ward it considerably exceeds 2,000 feet. The windows are glazed with plate glass, and this, with the thickness of wall required by the loftiness of the building, causes the wards to be sufficiently warmed by the single open fireplace. In the long wards of the northern block there are two subsidiary fireplaces, which, however, are used only in the coldest days of winter."

On endeavouring to estimate the fitness of this hospital for the purposes of its design, we are met with the very *great difficulty* that no *records of past* or present experience exist. Beyond the general recollections of those who have seen the practice at both, we have no means of comparing the salubrity of the old and new hospitals, and beyond the most general statements we have no means even of guessing what may be the success of practice in the present hospital. Even as to the great surgical operations which are so frequently practised here, we have no official statement of the numbers, nor of the results, nor indeed any statements whatever, except the records which are kept in the private case books of the medical officers, which are neither accessible nor perhaps complete. It appears, however, that secondary surgical affections used to be prevalent to a very great extent in the old hospital, very seriously affecting the mortality of surgical operations, whilst in the new wards there has been no outbreak of erysipelas or pyæmia *of importance*, although scattered cases have occurred, especially during the past autumn, when there has been a great tendency in this city to unhealthy action about wounds. During this period, some cases have occurred both of erysipelas and pyæmia after opera-



LONDON HOSPITAL.—First Floor.

(*To face p. 883.*)

tion, and two patients have died from each of these complications. On the whole, however, the sanitary condition of the new hospital is thought to be excellent.*

The mode of cleansing wounds at this hospital is somewhat peculiar. A sponge is ordered for each patient who has an open sore or wound at the time of his entrance into the hospital; this sponge is kept exclusively for that patient during the time of his stay, after which it is returned to the dispensary, and either destroyed or cleaned by some chemical process before being given out for another patient.

The wards are scrubbed partly every morning, and all over once a week. The walls are coated with Parian cement, and therefore want no white washing, but the wards are emptied every year, for thorough cleansing.

There is no artificial ventilation; the windows are kept open a little all night,† in ordinary weather. If this is not done the wards become close.

If any disease of a spreading nature (such as erysipelas, phagedæna, fever, &c.) breaks out in the hospital, the patient is isolated by taking away one or perhaps two beds in his neighbourhood. There are no other means of separation.

At the time of our visit it seemed that there were made up 71 medical beds, 66 surgical, and 10 for midwifery. There were 55 medical cases, 34 of which were acute. 63 surgical cases, 17 of which were accidents, including eight simple fractures, two compound fractures, and one burn. There were 33 cases of acute surgical disease, including one amputation of the thigh for disease, two amputations of the leg, one for injury and one for disease, one amputation at the ankle joint (Pirogoff), and three excisions of the knee. There was one case of erysipelas, not originating in the hospital; the other 13 cases were chronic or trivial. There were 35 open sores or wounds.

In 1861 we find from Dr. Guy's statistics that the death-rate was 10·7 over all the cases; 14·5 among medical, and 8·0 among surgical patients.

Of 169 deaths that are assigned to the hospital in 1862, seven were cases of persons who were dead before reaching the hospital, and should therefore be excluded, and of the remainder, 125 deaths occurred in physicians' patients. Of these eight are unaccounted for, two were in midwifery cases, 11 were cases of internal cancer or tumour, 55 were febrile and acute diseases, 49 were chronic and visceral diseases.

Of 37 deaths which occurred on the surgical side in 1862, five were unaccounted for. Of the other 32, 12 were after surgical operations; nine from accident, four from acute surgical diseases, four from chronic disease, and the others from internal acute medical affections.

J. S. B. T. H.

THE LONDON HOSPITAL is the greatest surgical institution in the metropolis. It is situated in a very densely crowded and poor district, one in which all kinds of the most dangerous trades are carried on, and where there is no other hospital for a very great distance. Consequently the number of severe accidents received here is far greater in proportion to the number of beds than at any other institution which we have visited, and they constitute an actual majority of all the in-patients received (2,180 out of 4,164 in-patients in the year 1862).† The regulations for the admission of patients partake of the nature of both the leading systems of hospital admission, since weekly admission by subscribers' letters is the formal rule; but the position of the hospital has so modified this that such patients form only one-third of the number admitted (1,300 against 2,864 in the same year). All infectious diseases are by rule excluded; but here again the rule acts differently in a large hospital like this, where *there are thousands* of out-patients, and in small country hospitals. Thus of the above number of 4,164, 684 were admitted without letters under the title of "extra cases admitted for the preservation of life;" and of these no doubt the great majority were cases of acute medical affections. The remarks below on the class of cases found in the house, and on the causes of death, will further illustrate the effects of these circumstances and regulations. We may sum up their chief bearing by saying that they give a prominent importance to the surgical department, and especially to the treatment of accidents; but that the medical wards receive a far larger proportion of urgent cases than would be admitted under the same regulations in hospitals differently situated.

The construction of the hospital is remarkable in many respects. This hospital is distinguished as being almost the only one in London which stands in a large piece of garden ground. It is an old building, dating from about 130 years ago, and is in the form of a block surrounding three sides of a square. The front of the hospital is divided longitudinally by a corridor, on one side of which are some smaller wards; but the main wards are in the wings. Each wing forms one large ward divided crosswise into four smaller ones, with a day-room in the centre. This partition is effected as seen in the plan by a "spinal" wall, deficient in parts, so that all the compartments of the ward communicate with each other, either directly or indirectly, by means of their all opening into the centre or day-room. This will perhaps be better understood by the plan than it would be by any long verbal description. The main fact to remember is that the several parts of the ward have the same atmosphere, and that they have windows on one side, and the (perforated) spinal wall on the other.

* The above sentences are extracted out of a private letter from one of the medical officers of the hospital. During the printing of these sheets a very serious outbreak of erysipelas has occurred, in which five or six fatal cases took place, and which prevailed to so great an extent that surgical operations were temporarily suspended. It did not last long, and has now, as we are assured, quite disappeared. It was noticed that it was suspended during a few days of hard frost. No cases of phagedæna or pyæmia occurred in this outbreak.

† The Northern and Southern Hospitals at Liverpool receive, perhaps, an equal proportion of accidents, but not of equal severity.

The ventilation of these wards is effected by numerous windows, and by doors* and fire-places mainly; but there are a few means of accessory ventilation, viz., openings above the door into the corridors, openings in the ceilings communicating with gratings in the house wall, and gratings which communicate with the outer air on one hand, and with a chamber behind the fireplace on the other, and from which a gentle current of warmed air is continually passing into the ward.

The beds are intended to alternate with the windows, on one side of the wall, which would give a clear space of 8 feet between the sides of contiguous beds, and to be placed at about the same distance on the opposite side of the wall. The breadth of the ward is such as to leave about 8 feet also between the two rows of beds. This would give 12 beds to each compartment of the large wards, and would allow 1,600 cubic feet of space to each bed; but the pressure on the resources of the hospital is so urgent that it has been found necessary to put many more beds into some of the wards than they were intended to hold. Thus in counting the number of beds in one of the accident wards lately it was found that they had been so much increased that each patient had only 900 cubic feet. Hitherto, however, no harm seems to have resulted from this crowding.

At the time of our visit the number of medical beds was 124, and of surgical 333, total 457.

There are three floors of wards, besides a few attics in the third floor used for special cases, and for cases of fever originating (as it very often does) accidentally in the house. These attics contain seven beds which are unappropriated either to sex, or to medicine or surgery.

There is a separate ward, but of four beds only, for female syphilitic patients. They are not admitted except by letter, so that very few apply.

There are also a few beds (17 in number) set apart in separate wards, or rather compartments, for persons of the Jewish nation, and strictly reserved for them. There is also a children's ward of 25 beds, to which only patients under the age of seven are admitted; and these are chiefly surgical.

On looking cursorily at the reports of this hospital, the reader is surprised to see, that while there is so much pressure on the beds, yet the average number occupied out of an assumed total of 450 is only 364. But this anomaly is soon explained. It is the habit here (and a very judicious one) to keep two male accident wards, and to fill and empty them on alternate weeks. Consequently on the day of the weekly discharge all the cases than can be sent away are discharged from the ward which has not received the patients of that week, in order to make ready for those of the next; and this accounts for a large number of the vacancies. The Hebrew portion also is seldom full, and often nearly empty, and the children's ward is also often not full.

Each large ward is under the superintendence of a head nurse, who has under her an assistant for each portion, and two night nurses. The head nurses and the day nurses live in the hospital. The head nurse has a sitting and a bed room adjoining the day room, in the interval between the compartments of the large ward. The night nurses live out of the hospital.

There are six large wards besides the attics, three small operation wards, with eight beds in all, three wards of medium size, containing 25, 34, and 16 beds, and the small syphilitic ward of four beds.

In 1862 the number of medical cases was 1,800, and of surgical 2,864.

The average duration of treatment in the hospital is 30·3 days, and is nearly the same for medical and surgical cases, being given as 29 days for the former, and 31 for the latter.

Phagedæna, pyæmia, and erysipelas are occasionally prevalent, but not to any alarming extent.† Erysipelas is not isolated. Hospital gangrene, if severe, is sometimes, but not generally, placed in the attics. No spread of disease has been noticed in the house, except two cases of small-pox a short time since.

Grave operations are generally placed in the small wards above referred to; but these were undergoing repair at the time of our visit.

Wounds in suspicious cases are cleansed with lint, which is then thrown away, but sponges are a good deal used in the wards.

The wards are scrubbed weekly.

The beds have curtains round the head, but these appear to be going out of use, and were taken down at the time of our visit.

The deaths in the year 1862 were 318 or 7·6 per cent., a somewhat lower rate than for the three previous years. The death-rate of the medical cases was 10·4, and of the surgical 6·4. These deaths were thus divided:—one was not classed; 136 were medical, two unaccounted for, 60 after acute diseases, 61 after chronic and visceral affections, and 13 from cancer; 181 were surgical, viz., 89 from the direct effect of injury, 43 after surgical operations, 41 from surgical disease, eight from miscellaneous causes, chiefly intercurrent visceral disease. Secondary affections were noted in 18 of these cases, viz., erysipelas in two cases, gangrene in one, and pyæmia in the remainder.

The results of surgical operations have been noted only for the year 1862, hitherto. During this year the following operations were performed:—

	No.	Died.
Amputation of the thigh for injury	4	2
" " for disease	9	3
" of the leg for injury	14	9
" " for disease	1	1

* It should perhaps have been noticed that the lobby between the ward and corridor allows of the ward door being kept always open.

† Since the above was written, pyæmia has been unusually prevalent.

	No.		Died.
Amputation of the arm for injury*	7		5
„ „ for disease†	2		0
Excision of hip, 2			
„ knee, 2	7	=	2‡
„ elbow, 3			
Herniotomy	27		13
Lithotomy	10		3

Of the medical beds, 124 in number, 103 were occupied at the time of our visit, and of these cases 50 were acute; the rest chronic or trivial. Of the surgical cases, 249 in number, 159 were accidents, comprising 49 cases of simple fractures, 17 compound fractures, and 13 burns or scalds; 41 were classed as acute diseases, comprising nine cases of the operations selected for comparison, viz., one resection (primary) of the elbow, three amputations of the thigh, two of the leg, one of the arm, one of the forearm, and one lithotomy. No cases of erysipelas or sloughing phagedæna originating in hospital were then in the house, but one of each affection commencing before admission; two patients were dying from pyæmia commencing in the hospital; the other 49 cases were chronic or trivial. The number of open wounds or sores was 131.

The system of large divided wards on which this hospital is built has been very freely criticised, and we may allow that it does appear liable to theoretical objections, and mainly to this, that it is hardly possible to give the wards the periodical cleansing which all wards ought to have, without either injudiciously disturbing the patients, and imperfectly effecting the object of a thorough change of atmosphere, on the one hand, if the separate compartments are emptied singly; or giving up more beds than can be well spared, even temporarily, on the other hand, if the whole ward is cleansed at once. We may also allow that if any compartment were to get into an unhealthy condition the whole ward might be affected. But in practice the plan works well, and is much liked. The central day-room especially is found to be a great comfort, and to serve equally for the ventilation and the convenience of the ward. Certainly, when we consider the great success in practice and the severity of the cases admitted, we shall hesitate before admitting that any such objections as we have referred to can have much weight, while actual observation will satisfy any one that these wards are to all appearance as fresh and as well ventilated as those on other plans of construction.

J. S. B. T. H.

ST. MARY'S.

ST. MARY'S HOSPITAL is a fragment only of a larger building, which it is proposed to erect when funds permit. It is situated in a populous district, not far from the Great Western Railway Terminus, and is surrounded more or less completely by houses and other buildings. There is however a garden behind, to which patients have free access.

The plan of the building (as it stands at present) is that of a simple oblong block, of which a large portion in the centre (large, that is to say, in comparison with the size of the building itself,) is sacrificed on a very fine staircase, with lift for patients, &c. The wards, four or five on a floor, are placed around this staircase, but do not all communicate directly with it, some being approached through other wards only, and others being connected with a small back staircase. Including the basement and ground floors, the hospital has four floors, of which the two upper are devoted entirely to wards.

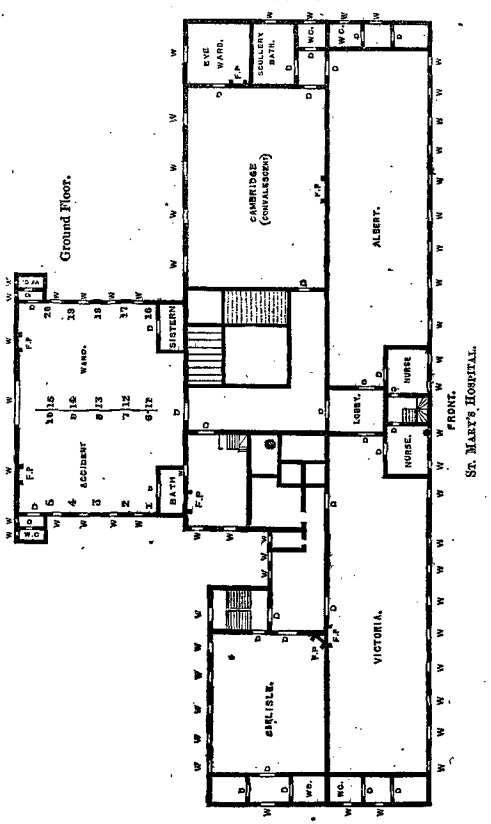
There is one large ward on the ground floor, and there are two in the basement. The latter two wards hold three and two beds respectively; one is intended for cases (chiefly surgical) which are offensive, or which from other causes require separation; the other ward is for the reception of cases of delirium. These wards are low and small. The ward on the ground floor (the male accident) is a large handsome ward, measuring 52 feet long, 38½ in breadth, and 18½ in height, and containing 22 beds. It is built out from the back of the main building, and is approached from the central hall. It has numerous large windows on three sides, besides two large circular ventilators in the ceiling for the escape of foul air, and many gratings in the skirting board which allow of the free entrance of the outer atmosphere. There are a sister's room and a bath-room opening out of the ward, and at each of the two free corners a water-closet, separated from the ward by a lobby. The beds are in four rows, one row being placed along each of the opposite sides of the ward, and the other two rows parallel to them, but back to back (separated, however, by a wooden partition seven feet high), along the central line of the ward.

On the first floor there are four wards. Of these, two (Albert and Victoria,) the male and female medical wards respectively occupy (with an intervening lobby and sister's room, and with water-closets and sculleries at the opposite ends,) the whole length of the front of the building. They are large wards measuring 80 feet long, 23 wide, and 18 high, and they contain 18 and 21 beds respectively. Behind Albert ward, and communicating with it, are two smaller but equally lofty wards, one a convalescent medical ward, holding 13 beds; the other a male eye ward, with three beds.

On the second floor there are five wards. Three of these occupy between them the same space as is taken up by Victoria and Albert below. They are of the same height and width, but necessarily shorter, and contain 10, 12, and 17 beds respectively. Two are for

* This probably is meant to include the forearm, as the latter is not separately noted.
† One at the shoulder joint.
‡ These deaths are not referred to the special operations. In one case amputation of the thigh was performed after excision of the knee.

male surgical patients, and one for female surgical. The other two wards on this floor are small operation wards, with four beds each, placed on either side of the operating theatre, and with the latter over that part of the first floor in which the male convalescent and eye wards are contained.



There are still three other wards for female patients, containing eight beds apiece, which occupy on the right side of the building a position very nearly corresponding to the convalescent and operation wards on the left side. Their height, however, is different to that of the other wards, so that, although they may be approached from them, their floors occupy a different level, and there is in connexion with them a back staircase. The lowest of these wards is intermediate in level between the ground and first floor, and is devoted to the treatment of diseases peculiar to women. The second ward is the convalescent medical ward, and the third or top ward the convalescent surgical. These three wards vary from 13½ to 16½ feet high.

The wards throughout the house, with one or two exceptions only, are large, lofty, and allow of a cubic space to each bed of between 1,200 and 1,900 feet. They seemed perfectly clean too, and in that respect wholly unexceptionable. The beds, perhaps, were not so widely separated as one would like to see them. The water-closets are, on the whole, very conveniently and well situated as regards the wards, clean, well-ventilated, and well drained, though we were informed that ill-smells occasionally arise from them. There is an ample supply of bath-rooms, and patients are as a rule bathed on admission. The ventilation of the wards deserves a more detailed notice. First, the windows are generally large, although frequently the top does not nearly approach the ceiling; but they vary in their construction in different wards. In the accident ward they are divided into four horizontal compartments, of which the three upper open by revolving inwards upon their lower border. In the front wards on both floors the windows are double. In the outer window the lower part (perhaps one sixth) revolves on its horizontal axis, and in the inner window the upper part revolves in a similar manner, so that when both are opened the air passes in below, ascends between the windows, and enters the ward above. The lower part of the inner window allows of being opened like a door. The windows belonging to most of the other wards are ordinary sash windows. In all the wards, except the accident ward, the windows are on one side only, but generally on the other side there are openings of considerable size which lead either from one ward into another or from the wards into the staircase. There is besides an artificial mode of ventilation employed; air is admitted from without, over a coil of pipes heated by hot water, and passes thence through a series of passages which surround the wards, and then enters the wards through numerous orifices in the lower part of the wall. For the purpose of removing foul air there are also numerous openings variously arranged in the ceilings and in the upper part of the walls; these are connected by a series of flues, with a central shaft of considerable height, wherein a fire is always kept burning. The secretary informed us, however, that there is reason to suppose the whole apparatus is a failure; that Dr. Sanderson had made numerous experiments which led him to the conclusion that the orifices of exit in the wards act little, if at all, and very often admit air instead of carrying it off; and that there is, in fact, rather a circulation of air in the shaft than an escape of air from it. On the whole the ventilation of the wards, excepting of course that of the accident ward, seemed to us very imperfect. The wards are heated by open fire-places as well as artificially, and they are lighted by gas. The wards are scrubbed once a week by scrubbers, and the hospital itself is cleansed and whitewashed once a year. The bedsteads are of iron, without curtains, and the mattresses of horsehair.

The nursing staff consists of seven sisters, nine day nurses, and seven night nurses. The treatment adopted is generally stimulant; water dressing is commonly employed, and in cleansing wounds both sponges and tow, but the latter chiefly.

Patients are admitted weekly by letters, but accidents and urgent cases gain admission at any time. The proportion of cases admitted without letters is large; in 1862 648 were admitted by letters and 1,067 without. Small-pox, itch, primary syphilis, and confirmed consumption are excluded; but all other diseases (including those which are infectious) are admitted. The medical and surgical cases are separated; moreover, certain of the wards are convalescent wards. There is a ward for diseases of women, two wards for diseases of the eye, and two for special cases, hospital gangrene, delirium tremens, &c.

The hospital contains 155 beds, of which 82 are for males, 68 for females, and five for males or females, according to circumstances. 63 of the beds are for medical patients (including eight beds for diseases of women), and 82 are for surgical patients (including five for eye cases), and five are special beds for males or females. The average daily number of patients in the hospital during 1862 was 130 (65 medical and 75 surgical).

At the time of visit there were in the hospital 61 medical and 69 surgical patients. Of the medical cases 20 might be regarded as acute and 35 chronic. Of the acute two were suffering from diseases unimportant as regards danger to life, and 18 were suffering from serious diseases, including rheumatic fever in seven cases, typhoid fever in three, erysipelas in two, typhus in one, and scarlet fever, dropsy after scarlet fever, and peritonitis, severally, in three. Of the chronic cases 19 were unimportant, and 16 (including such diseases as heart disease, aneurism, phthisis, and chronic bronchitis) were grave. Six others were suffering from diseases peculiar to women.

Of the 69 surgical patients, 11 were suffering from acute diseases, 30 from accidents, and 28 from chronic diseases. There were 28 open sores in the house. Among the cases included in the above number, were 12 simple and five compound fractures, two burns, and two operations of the classes selected (Syme's amputation and amputation of the thigh); there were two cases of phagedæna, one of erysipelas, one of inflamed absorbents, and one of pyæmia, all of which had originated in the house, and one of inflamed absorbents and one of erysipelas, which had been admitted for these affections.

The following is the list of patients admitted and dead, and the per-centage mortality for three years:—

		Admitted.	Died.	Per Cent.
1862	Medical	904	95*	10·5
	Surgical	811	69*	8·5
	Total	1,715	175†	10·2

* Excluding 11 brought in dead.
† Including 11 brought in dead.

No. 15. *The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.*

		Admitted.	Died.	Per Cent.
1861	Medical	898	103	11·5
	Surgical	798	68	8·5
	Total	1,691	171	10·1
1860	Medical	866	115	13·27
	Surgical	820	51	6·34
	Total	1,686	166	9·8

METROPOLITAN HOSPITALS.

ST. MARY'S.

The published reports for 1861 and some previous years give very excellent information with regard to the nature of the cases admitted and their results. And we proceed to quote some items of information from the records of the last-named year. It appears that there were three cases of typhus received in that year and 28 of typhoid, 15 of scarlet fever, six of measles, eight of erysipelas, and five of diphtheria; of acute rheumatism, 66, and of cancer 11. Brain diseases numbered 103, including 25 cases of apoplexy and six of delirium tremens. Diseases of the circulatory system numbered 66; diseases of the respirating system 212, including 29 of acute bronchitis, 29 of pneumonia, and 76 of phthisis; diseases of the chylopoietic viscera 95. Among the causes of death in medical cases we found the following:—two from fever, two from scarlet fever, one from diphtheria, five from cancer, and 13 from acute inflammations. 12 deaths were due to acute disease of the brain, 16 to phthisis, 22 to heart disease, and 10 to chronic renal disease.

On looking at the surgical records we observed that there were 27 cases of burns and scalds, with 14 deaths, a case of frost-bite in which death resulted from erysipelas and pyæmia, 19 cases of concussion of the brain, with five deaths, and eight of fracture of the skull, of which six died, three cases of compound fracture of the arm, with one death, a fatal case of compound fracture of the thigh, nine compound fractures of the leg (two fatal,) and one of the ankle. There were also 12 cases of strangulated hernia, with three deaths, and five of vesical calculus, with one death.

Besides the case of pyæmia above given, we find recorded in the register a death from pyæmia after perinœal section, two non-fatal cases of fracture of the nose, followed by erysipelas, 16 cases of erysipelas and diffuse cellular inflammation, with two deaths, and a case of caries of the temporal bone, followed by pyæmia and death.

The following are the operations for the three years 1860, 1861, and 1862:—

	No.	Died.
Amputation at hip or of thigh, for accident	1	1
" " for disease	7	2
" of leg, for accident	1	0
" " for disease	4	1
" of arm, for accident	1	0
" " for disease	1	0
" of forearm, for disease	1	0
" excision, elbow	1	0
" herniotomy	26	11
" lithotomy, adult	5	1
" " child	4	0

We were informed that in the female medical ward two cases of typhoid fever had broken out in patients admitted for other diseases, and that in another of the female wards two cases of the same disease had originated. Scarlet fever occasionally spreads, and so also does typhus. Last January (1863) there was an outbreak of small-pox, traceable to the admission by mistake of a case of this disease. It appeared chiefly in the surgical wards (where 12 cases occurred), and was only eradicated by emptying and purifying, the hospital ward by ward. Pyæmia is said to be not common, but the quotation above shows that it occurs. Hospital gangrene is common in the two male surgical wards, and during the last summer a good deal of erysipelas prevailed.* Nurses catch diseases not unfrequently, especially scarlet fever. One or two have had typhus and typhoid.

The hospital cannot certainly be regarded as a healthy one, for most of the diseases which constitute unhealthiness in a hospital seem to prevail in an unusual degree, and there seems also to be considerable spread of infectious fevers. The wards are lofty and clean, the operation cases seem comparatively few, and no larger proportion of acute cases appears to be received than in other London hospitals. The explanation seems to be, that the ventilation is, from the construction of the hospital, necessarily imperfect. The plan on which the hospital is built we think defective. The wards, with one exception, have windows on one side only; they communicate with one another, and indeed appear to have all the defects of the corridor-system of building, without the advantage of the corridor itself.

J. S. B. T. H.

MIDDLESEX.

THE MIDDLESEX HOSPITAL, in Charles Street, Tottenham Court Road, is situated in a populous part of London, and is adjoined on either side by houses. It has, however, in the rear, a large garden, in which the patients take exercise, and which gives the hospital the advantage of a free access of air.

* Since the above was written, the hospital has been again severely visited by hospital affections, which have indeed been unusually prevalent of late, both in the in and out-patient practice of many London hospitals.

The hospital, consisting of four stories and a basement, has the form of the letter H. The transverse connecting portion presents on the three lower floors a central corridor (with rooms opening out of it back and front), which terminates at either end in a lobby and a staircase, separated by a party-wall from the wing. No part of this central portion of the hospital is used for wards, excepting the attic floor; here, three comparatively small rooms, containing 26 beds between them, and occupying (each of them) the whole width of the floor, are appropriated as an asylum for females suffering from cancerous affections.

The remaining wards, 16 in number, occupy the two wings. The general plan of a floor of each wing is this:—all that portion projecting in front of the central building forms one large ward, and all that portion projecting behind it forms a smaller ward, while the intermediate space, corresponding to the entire thickness of the central block, is occupied by a lobby, communicating by doors with the corridor and with the wards, and having in two of its corners a sister's room and a bath-room respectively. The anterior ward, holding 20 beds, is long, tolerably broad, and lofty; has numerous windows on both sides, and windows at one extremity. The posterior ward is shorter than the last, but otherwise resembles it, and contains 15 beds. The chief differences shown on different floors are, that on the ground floor two of the wards project in length beyond those above them, and are hence larger, and contain more beds (one has 26), and that on the attic floor some of the wards are smaller, and a little differently arranged.

The hospital generally seems to be well ventilated; the corridors themselves, by the aid of lobbies and staircases, are light and sweet; the wards have of all of them a fair proportion of windows on both sides, and windows also at one end, which open in three pieces inwards. Ventilation is further aided by ventilators placed in the walls above the windows. The wards are heated by open fire-places. Bath-rooms are conveniently placed; and water-closets, which are well drained, and in a satisfactory condition, and separated from the wards by a small lobby, are connected with each of the larger wards.

The bedsteads are of iron, and, except in special cases, without posts or curtains. The mattresses are of horse-hair. The cubic space allowed to each bed in the different wards varies generally between 1,100 and 1,400 feet. In several of the wards, however, the allowance is not more than from 920 to 980. The wards are scrubbed by the nurses, assisted by the patients; and the hospital itself is cleansed and whitewashed thoroughly once a year, and as far as practicable emptied.

The nursing staff comprises 9 sisters, 22 day nurses, and 9 night nurses. They reside in an adjoining house, to which a passage gives them access. Wounds are dressed simply, water dressing being chiefly employed. Cotton wool is used in the cleansing of wounds; no sponges.

Small-pox, itch, and, by rule, phthisis, are excluded, but syphilis, typhus, and scarlet fever are admitted. All cases, except those suffering from accident and other cases of great urgency, are admitted by letter once a week. Medical and surgical cases are separated; there are also special accident wards, wards for cancer, for syphilis, and for diseases peculiar to women. There are two or three small rooms in the basement, to which cases of delirium, and cases of small-pox (should they occur) are removed.

The hospital contains 19 wards, and is said to make up upwards of 300 beds. At the time of our visit there were apparently 293 beds in use, of which 114 (including eight for uterine diseases) were medical, and 179 (including 22 venereal beds, and 26 devoted to cancer patients) were surgical. The number of patients in the house was 207. Of these 92 were medical cases, 80 ordinary surgical cases, and 35 were cases of cancerous or venereal affections. Of the 92 medical patients seven were labouring under uterine affections; and of the remainder 42 were suffering from acute diseases, and 43 from chronic. Six of the acute cases were trivial, as regards danger to life, but the other acute cases were serious, and comprised 12 cases of acute rheumatism, eight cases of scarlet fever, with two of scarlatinal dropsy, two cases of erysipelas, two of typhoid, one of typhus, and several examples of acute internal inflammations; of the chronic cases, 22, comprising heart disease, Bright's disease, &c., were of serious importance. There were two patients in the wards, one suffering originally from some trifling ailment, and one from typhoid fever, who had contracted scarlet fever while under treatment in the hospital. Of the 80 surgical cases in the general surgical wards, 29 were cases of accident, 24 were acute cases, and 27 chronic. These cases comprised 38 open wounds; and among them were 14 simple fractures and one compound fracture, four burns and scalds, two operations of the selected classes, three cases of erysipelas which had originated in the house, and a case of erysipelas and one of phagedæna which had been admitted with these affections.

The daily average number of beds occupied during the three years ending with 1860 was 225.

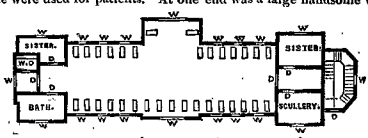
The records of the hospital unfortunately seem very imperfectly kept, and hence the experience of the institution, for those at least who are not of it, is in great measure lost. It appears that in the year 1862 2,278 cases were admitted, of whom 871 were medical cases, 611 surgical, and 796 cases of accidents (including, probably, urgent medical cases). All except the last number, 796, were admitted by letter. The deaths during the year amounted to 266, and hence the mortality per cent. was 11·6. We were allowed to examine the records of death, but they were imperfect; it was difficult to distinguish with accuracy the medical from the surgical deaths, and the causes of death in some cases were entirely omitted, 23 were simply entered as inquest cases. The records showed, however, that both the medical and surgical deaths were generally of the same character as

those at other London Hospitals, excepting that the proportion of deaths from cancerous diseases seemed (as one might have expected it to be) large. Among the deaths were those of two patients and of two nurses who seem to have contracted typhus while in the hospital.

The wards of this hospital are generally cheerful and well suited for hospital purposes. On the whole, the opinion we formed as to the plan, arrangements, and condition of the hospital was in the highest degree favourable.

J. S. B. T. H.

ST. THOMAS'S HOSPITAL, one of the three endowed general hospitals of London, and normally one of the largest, has been recently (within the last 18 months) dispossessed of the site, in close contiguity with Guy's, on which for more than three centuries it stood. Prior to its removal it made up 520 beds, of which about 200 were medical, and the remainder surgical. It consisted then of portions built on three different plans. First, there was a square block, consisting of four nearly square wards, placed one over the other, with a common staircase, cut, as it were, out of one corner, and with a sister's room, a ward-kitchen, a water-closet, and a bath-room, occupying the greater part of one side of each ward. Windows were placed at intervals on three sides, and fire-places (back to back), with their common chimney, occupied the centre. The wards (especially the top one) were rather low. For years these had been used for the reception of male and female syphilitic patients, but latterly had been appropriated to male medical patients. Second, there was the main hospital, and that which was of oldest date, forming two unequal squares. This presented, with the attic and ground floor, four stories. The ground floor contained offices, out-patient department, &c., and presented, in the greater part of its extent, a continuous system of open corridors, with wide passages leading from one square to the other, or from the squares to other parts of the hospital. The wards were chiefly on the first and second floors, and were approached by several staircases. They resembled very much the old wards of Guy's Hospital, both in form and manner of lighting and ventilation. They were, however, of more ancient date, and in some respects inferior. Third, there were two detached wings, abutting on the main road (Wellington Street); these had been erected within the last 20 or 30 years, and the intention was, gradually, as funds permitted, to take down the older parts of the hospital, and to re-erect them on the plan of these new buildings. These wings resembled one another in most respects, excepting that from circumstances, useless now to name, one wing had to be curtailed of its full proportions. The other wing presented, with basement and attic, five floors, of which three were used for patients. At one end was a large handsome well staircase,



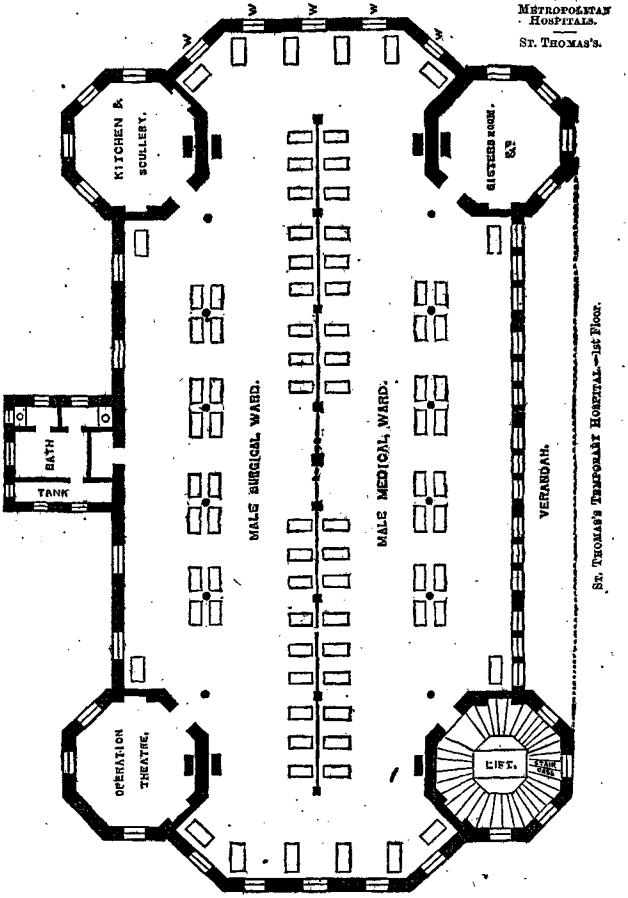
Plan of new North Wing.

opening out of which were the wards. These (one on each floor) were 110 feet long, 28 wide, and 16, 15, and 14 feet respectively in height. They contained 30 beds each, had numerous sash-windows on both sides, with ventilators at intervals along the ceiling. On either side of the entrance was the sister's room and a scullery, and on either side, at the opposite extremity, was the sister's bedroom and the bath-room, with the water-closet in the interval between them. There was a window into the corridor over the door, and a window at the opposite end over the water-closet. The wards were warmed by open fire-places, and lighted by gas. They were exceedingly fine wards, in fact, unquestionably the finest wards in London.

The hospital was removed to its present temporary site in the Surrey Gardens, Newington, in the autumn of 1862. A building, formerly the scene of Jullien's concerts, was adapted to the reception of patients. This temporary building, of which a plan is given, consists of three floors. One half of the ground floor is used as a male accident ward, and contains 36 beds. The first floor forms a single ward for the reception of male (medical and surgical) patients; and the second or top floor, forms a similar ward for the reception of both classes of female patients. These latter two wards hold 84 patients each. The two upper wards are 150 feet long by 70 feet wide; the ground and first floors are 16 feet high; and the upper ward, which has a handsome arched roof, extending from one end to the other, and occupying the greater part of the width of the building, is in its highest part 36 feet high. Each ward is subdivided in nearly its whole length by a central wooden partition about seven feet high; and the beds are thus arranged:—13 are placed along either side of this partition; midway between the partition and the side wall are in each half ward four groups of four beds each; and at either end of the ward, placed for the most part alternately with windows, are eight more beds. The beds, therefore, it will be seen, are many of them back to back (almost touching), being separated from one another only by the wooden partition or by their own head curtains. The lateral distance between beds is generally about a yard. There are six rows of beds between the opposite windows.

Ventilation is effected by a large number of windows placed at very short intervals all round the wards; they are however small and low. Besides these there are doors, open

fireplaces, louvres over the entrance doors, and in the ceilings, gratings, or trap-doors for the escape of foul air. The wards are warmed by open fire-places, the flues of which ascend within the wards, and by coils of iron-pipe heated by hot water. The walls are of brick,



whitewashed; the floors of ordinary wood, which has to be scrubbed; the doors and great part of the wood work of varnished deal. The ceilings also are of wood; those of the ground and first-floors consisting of numerous closely arranged longitudinal beams whitewashed, and that of the upper floor of a series of polished planks.

METROPOLITAN HOSPITALS.

ST. THOMAS'S.

The wards, especially the upper one, have an imposing appearance; they seem to be perfectly well ventilated and free from odour, and even in winter time maintain a comfortable temperature. Some of the medical officers complain both of the coldness of the wards and of the draughts in them; but sisters residing on the spot seem to regard the present building as preferable in both of these respects to the older hospital. An objection to the large wards containing both medical and surgical patients is the noise which the presence of so many inmates necessarily occasions.

It should be added that the hospital contains, besides the above wards, a private room for three patients; that it contains therefore 207 beds, of which (excluding the three just mentioned) 120 are for males, 84 for females, and of which 84 are for medical and 120 for surgical patients.

It is worth while to say a few words specially about the nursing of this hospital, which is at the present time, and has been for several years past, of peculiar excellence. Prior to 1858 there was a sister to each ward (19 in number), with a day and a night nurse, and in one or two instances an additional nurse or two. All lived in the house, but were required to board themselves; the nurses, moreover, had to scrub the wards. The salaries of the sisters were from 50*l.* to 60*l.* per annum, and those of the nurses from 10 to 13 shillings per week. From the time mentioned a new system was gradually introduced. Special scrubbers were appointed, one to each ward; the day and night nurses continued numerically the same, but were expected only to nurse, and had each a fixed salary of 21*l.* per annum, with board and lodging; and the sisters were reduced to seven, one, as a rule, taking charge of three wards, and their salaries were fixed at 50*l.* per annum each, and they, like the nurses, were provided with board as well as lodging. Subsequently, in 1860, the duty of instructing the "Nightingale" nurses was undertaken, and thus 15 additional nurses were practically added to the staff. This system has continued in operation ever since; but the numbers have necessarily been reduced with (though not in proportion to) the diminution of the hospital. At the present time there are five sisters, nine day and eight night nurses, 12 probationer nurses, and 10 scrubbers.

At the time of our visit the hospital contained 192 patients, of whom 108 were males and 84 females, of whom 77 were medical and 115 surgical. Of the medical cases, 27 were suffering from acute affections, including 22 (such as typhus, typhoid, pneumonia, pleuritis, acute rheumatism, &c.) of a grave character, and 50, of which 28 were in more or less danger as regards life, were suffering from chronic affections. Of the 115 surgical cases, 37 were cases of accident, 29 were acute cases and 49 chronic. There were 57 open wounds in the house. Among the above cases were 24 of simple fracture and four of compound fracture, with 11 operation cases, including two primary amputations and one pathological amputation of the thigh, a pathological amputation of the foot, an excision of the knee, two excisions of the elbow, a castration, and a case of herniotomy.

During the year 1863, 1846 patients were treated to a termination, of whom 191 (or 10·3 per cent.) died. This number includes patients brought dead to the hospital. Of the patients, 888 were medical, with 177 deaths, and a mortality of 13·1 per cent.; and 958 were surgical, with 74 deaths, and a mortality of 7·7 per cent.

The annual number of patients discharged, and the mortality and per-centage of deaths, during the years 1858, 59, and 60, were as follows:

—	Medical total.	Deaths.	Per Cent.	Surgical total.	Deaths.	Per Cent.	Total.	Deaths.	Per Cent.
1858 - -	1989	245	12·3	2358	105	4·5	4347	333	8·1
1859 - -	2066	253	12·2	2027	95	4·7	4093	348	8·5
1860 - -	1920	231	12·0	1951	116	5·9	3871	347	8·9

The following is the list of operations (selected for comparison) performed during the years 1857, 58, 59, and 60 at the old hospital, and during the year 1863 at the temporary hospital.

—	Old Hospital.		New Hospital.		Total.	
	No.	Died.	No.	Died.	No.	Died.
Amputation of thigh - -	26	12	4	1	30	13
,, leg and foot - -	22	7	7	—	29	7
,, arm - - -	8	2	1	1	9	3
,, fore-arm and hand -	12	1	—	—	12	1
Excision of hip - - -	1	1	—	—	1	1
,, knee - - -	14	4	5	—	19	4
,, shoulder - - -	2	1	1	—	3	1
,, elbow - - -	7	0	1	—	8	—
Lithotomy - - - -	33	4	1	—	34	4
Hernia - - - - -	50	13	8	5	58	18

The health of the old hospital was generally good, much in fact like that of St. Bartholomew's and Guy's; pyæmia and erysipelas appeared occasionally, but not often to a

serious extent. An exception, however, occurred in a ward of one of the surgeons, several years ago. In this, which had not the reputation of an unhealthy ward, pyæmia without obvious cause became endemic, numerous cases occurred, and the disease persisted for a considerable time, notwithstanding that the ward was emptied, and the floors were oiled instead of washed, and the walls painted instead of lime whitened, and certain structural changes effected. Scarlet fever and typhus occasionally spread both to nurses and patients. But these diseases rarely, if ever, spread from one bed to those immediately on either side. During the year of the typhus-epidemic (1862) more than 92 cases of typhus were admitted, and they communicated the disease to 14 persons—10 nurses and four patients. Of the nurses all recovered, of the patients two died. In the same year scarlet fever was contracted in the hospital by one nurse, who recovered, and by one patient, who died.

It is interesting to note that the healthiness of the new hospital differs but little from that of the old. Erysipelas occasionally attacks surgical cases, and a few cases of pyæmia have occurred, but operations generally have succeeded well. Typhus, scarlet fever, and, by accident, a few cases of small-pox have been admitted, but with results, as regards patients, of little importance. There have, during the 15 months the new hospital has been in working order, been admitted between 20 and 30 cases of typhus; one nurse has contracted the disease, and died of it, but no patients have caught it. A good many cases of scarlet fever have at various times been admitted; one nurse took scarlet fever (but whether from a patient was extremely doubtful), and died, and about three, certainly not more than four patients, in the hospital, have been also attacked with it, but they were far removed from any other cases of the kind, and certainly had no direct communication with them. The latter cases recovered. Two or three patients have been attacked with small-pox in the hospital. One of them was within a bed or two of a case of suspected small-pox. At another time two patients in a surgical ward were attacked almost simultaneously with the disease. They had both been in the hospital some time, and there was neither at the time, nor had there been for a considerable period previously, any case of small-pox in the hospital.

METROPOLITAN HOSPITALS.

ST. THOMAS'S.

These details have been gone into chiefly because it seemed desirable to ascertain how far and in what way, if at all, the peculiar structure and arrangements of the temporary hospital have influenced its sanitary condition. The experience hitherto seems to be undoubtedly favourable.

It is interesting to observe that the mortality, both medical and surgical, is heavier now than it was at the old hospital. This, however, clearly does not depend on unhealthiness, that is to say, on the development and spread of hospital diseases, but on what may be termed accidental causes, of which the comparative smallness of the present institution is doubtless one.

J. S. B. T. H.

UNIVERSITY COLLEGE.

UNIVERSITY COLLEGE HOSPITAL is one of the smaller and unendowed London hospitals, having only 67 surgical and 48 medical beds.* This small number of beds is further reduced by limiting the admission during the vacation of the medical school, in order to economize the scanty funds of the hospital. On the other hand, there is a large medical school, and there are a great number of patients coming from the crowded district in which the hospital is placed, and numerous severe accidents brought from the great railway station in the neighbourhood, so that the cases are selected, *i.e.*, as a general rule, severe. The admission is by letter, in ordinary cases; but as letters are received daily, instead of weekly, the effect of this rule is less discouraging to the advent of acute cases than where the weekly admission day is adhered to. Under these circumstances it seems probable that a large proportion of the cases must be admitted on their own merits, as urgent cases; but we have no distinct information on this head.

The infectious or contagious diseases (so called) are excluded by rule, but this rule appears to be often neglected in the case of typhoid fever. It appears, therefore, that the general average of cases would be somewhat less acute at this hospital than at some of the other metropolitan hospitals (on account of the exclusion of scarlet fever, measles, typhus, and typhoid fever,) but for the special circumstances of the smallness of the hospital, and the requirements of clinical teaching, which prescribe the exclusion of chronic and trivial cases, so that on the whole the cases may perhaps be more severe on an average than at the larger hospitals. The same causes also tend to keep the hospital full, at least in the time of the medical sessions, when only a few beds required for the reception of casualties are kept vacant. In the vacation it is otherwise, but even then the amount of spare room is not great. At the time of our visit, which was in vacation, there were 15 vacancies on the surgical side and seven on the medical, *i.e.*, 98 patients in 115 beds.

This hospital is purely metropolitan. It has nothing but a small square court (642 square yards) for exercise, and has no parks at hand into which convalescents can be allowed to go, as at St. George's and Westminster. The plan of the building is extremely simple. It consists of a long block of buildings, facing opposite University College, with a small wing perpendicular to either end. In the centre of the main block is the main staircase, out of which the main wards open on either side. This is opposite to the front door of the hospital, which, however, is generally kept shut, and the entrance made by a side door in one of the wings. From this side door a corridor, occupying only the

* The total number of beds appears to vary somewhat at this hospital from temporary causes: The above was the number which appeared to be made up at the time of our visit.

METROPOLITAN HOSPITALS.

UNIVERSITY COLLEGE.

ground floor, runs along the back of the main building, giving access to the central staircase, and to various offices on the ground floor of the main building, on the one hand, and to the operating theatre, dead house, dispensary, &c., which partially fill up the courtyard, on the other. This corridor, however, does not reach to the height of the wards, so that the latter, even on the ground floor, have windows at the back as well as front. Besides the main wards, which contain 13–15 beds each, there are smaller wards containing six or seven, and private wards for single cases; the smaller wards occupy the wings and corners of the building, and the private, or single-bedded wards, are placed at the end of the main wards, being portions (so to speak) cut out of them. All are spacious, and well ventilated by opposite windows in all the larger wards, together with some ventilating holes into the roof in the upper wards. The cubic space is ample. It appears to give about 1,500–1,600 cubic feet to each bed* in the large wards, somewhat less in the smaller wards, and about 2,000 in the single-bedded chambers. The beds are separated from each other by a considerable space, which is often as much as six feet, and in very few cases less than four feet, and the windows are kept somewhat open, on one side or the other, according to the direction of the wind, by night as well as day. No inconvenience or damage is experienced to medical cases from this practice; but it ought to be noted that acute cases (bronchitis, pneumonia, &c.) are, when necessary, taken to the private wards, and treated, as to ventilation as well as other matters, as their peculiar circumstances demand.

Three stories are used as wards. No difference has been noticed in the healthiness of the upper and lower floors.

The practice of the hospital appears to be successful. The death-rate is high, as would be expected from the class of cases admitted. It was 12·07 per cent. in the year 1862. Secondary surgical affections have not been numerous of late. At the time of our visit there were only two cases of erysipelas (of the phlegmonous variety) in the hospital, and one of these had been admitted with the disease. An outbreak of phagedæna had occurred a short time before, which did not subside until the wards had been emptied, and the walls scraped and whitewashed. Pyæmia was noted as the cause of death in five cases out of 66 deaths of surgical patients during the year 1862. When erysipelas and the allied affections show themselves, the cases are, if possible, placed in some of the small separate wards, and this is done especially if there are many cases of operation or large wounds in the ward so affected.

The list appended shows the number and mortality of the operations in the classes selected for the three years 1855–57 inclusive. The selection of those years was fortuitous, the lists not having been made up for the most recent years.

	No.	Died.
Amputation of hip	1	1
,, thigh for injury	5	4
,, ,, disease	10	3
,, leg for injury	2	—
,, ,, disease	3	1
,, ,, Syme's	2	—
,, arm, for injury	1	1
,, ,, disease	1	—
,, fore-arm, disease	3	1
Excision of knee	7	1
,, elbow	4	—
Strangulated hernia (all forms)	22	9
Lithotomy (child under 15)	1	—
,, adults	5	2

There were in hospital at the time of our visit 52 surgical patients to 67 beds. Of these, 17 were for accidents (including three compound and 11 simple fractures, and one burn); 15 for diseases marked as acute (including four operations of the selected classes, viz., one amputation of the thigh and three of the leg); and 20 for diseases classed as chronic or trivial. 28 out of these 52 patients had open sores. There were two cases of diffuse inflammation of the cellular tissue, one of which had originated in the hospital.

On the medical side, out of 41 cases in the 48 beds, 22 were classed as acute.

J.S.B. T.H.

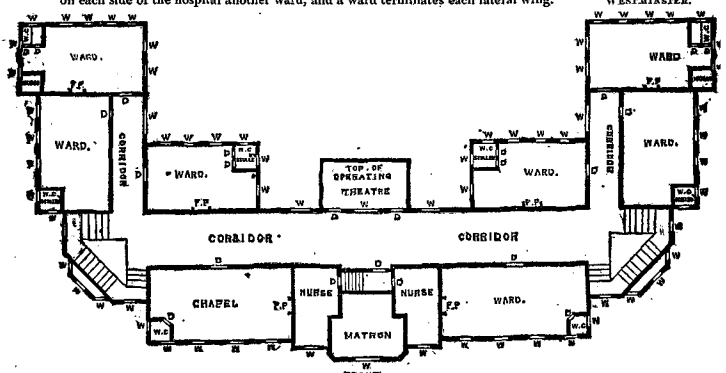
WESTMINSTER.

The WESTMINSTER HOSPITAL, which was erected in the year 1834, is situated in Broad Sanctuary, Westminster, in a position which affords a large open space in front, but brings with it, in other directions, the disadvantages which arise from the contiguity of lofty close-packed buildings. It has no airing-ground for patients, who have to seek exercise, when they require it, in the neighbouring park.

The hospital is a somewhat handsome building, of five floors (basement and attic included), constructed symmetrically on the corridor plan. It is, like some other hospitals we have seen, ingeniously arranged, so as (notwithstanding the limited space on which it had to be erected, and the difficulties which the corridor plan creates) to secure a considerable amount of ventilation for the various wards. Its general plan is this: there is on each floor a long, wide, lofty corridor (extending completely from one end of the building to the other), from each extremity of which another smaller and much shorter corridor passes at right angles backwards, and ends by opening into a terminal ward. At each of the two angles where the corridors meet there is projecting from it a handsome

* This refers to the number of beds given above as being in the wards at the time of visit.

well staircase, with an abundance of windows, and with a ventilating lantern above. The wards and the rooms are arranged as follows: in the concavity formed by the corridors there are on each floor three rooms, two of them (wards) are situated respectively one in each angle, and the third, smaller in area and perfectly distinct from the wards, occupies the centre of the space between them. Intervals are thus left in which the corridors obtain direct light and ventilation by windows. On the convexity of the corridors the arrangements differ somewhat on the different floors; but, if the second floor be taken for description, there are in the centre (over the entrance hall) three small rooms for the matron and for nurses, and two long rooms, one on either side, extending to the staircase, and forming respectively the chapel and one of the wards. Similarly placed to the last as regards the staircase, but abutting on the whole length of the small corridor, there is on each side of the hospital another ward, and a ward terminates each lateral wing.



WESTMINSTER HOSPITAL.—2nd Story.

The wards are all 14 feet high, of an oblong shape, and sufficiently large to accommodate from twelve to nine beds apiece. They differ somewhat, but not very greatly, in dimensions. The terminal wards have windows on three sides, and all the others have them on two contiguous sides. The windows are perhaps rather small, and the upper portions open by revolving on their lower edge. They are kept constantly open. Ventilation, however, is not dependent on windows alone. There is an air-chamber around the base of each ward, communicating freely on the one side by numerous gratings with the external air, and on the other side at frequent intervals with the ward itself. There are also in the ceiling of each ward two ventilators, communicating with a conical tube, which passes upwards to the roof between two smoke-flues. Ventilation is aided, and the air which enters is warmed, by means of hot-water pipes. These pipes are carried up from a boiler in the basement, pass on each floor along the corridors, and form a coil at each opening, through which the outer air is admitted. The wards have also open fire-places. The scalleries and water-closets are in the wards, in a kind of wooden closet, and are therefore objectionably placed; they seemed, however, to be free from ill-smell, and are well drained. There are baths in the basement for the use of out-patients and convalescents; but those used for other in-patients are moveable baths only. In several of the wards there is a small wooden compartment (much like that containing the water-closet and scullery) used as a nurse's room; but the sleeping-rooms for nurses are all on the attic floor. The wards seemed clean, and are scrubbed twice a week by scrubbers. The bedsteads are of iron, without curtains. The mattresses of flock.

The nursing is conducted by six head nurses or sisters, a night sister, and 14 (day and night) nurses. They all live in the building, and are fed at the hospital expense.

The treatment adopted is generally stimulating. Most wounds are treated by "sealing" with collodion and strapping; water dressing and poultices are both much employed. Cotton wool is largely used in cleansing wounds, and so also are sponges; some patients whose cases are severe keep their own sponges.

Urgent cases are admitted at all times; but patients with governors' letters are expected to apply on Tuesday. To show the proportions of those admitted with and those admitted without, we may mention that in 1862 559 persons were admitted by letters and 1,269 were received as cases of urgency or accident. The cases which are by rule excluded are chiefly those of persons with small-pox, confirmed phthisis, and ulcerated legs of old standing; but, except with regard to the first-named affection, the rules are not very stringently enforced. There is a special ward (of eight beds) for female pensioners.

METROPOLITAN HOSPITALS.

WESTMINSTER.

The hospital contains 18 wards, with from 10 to 12 beds apiece, and two small separation wards, with two beds each. The entire number of beds is 191; but of these eight are occupied, as just stated, by female pensioners, and will be excluded from computation. 85 of the remaining beds are for the reception of male patients, and 98 for the reception of female patients. 89 are appropriated to medical cases, 96 to surgical cases, and four are for the reception of special cases, either medical or surgical. Medical and surgical cases are separated, and there is a special ward for female diseases. But, with the exception of the provision of the separation wards, there is no further classification.

The wards appear to be generally very fully occupied; the average number of daily occupants in 1862 was 154, and the average stay in the hospital was between 30 and 31 days.

At the time of visit there were in the house 175 patients, exclusive of pensioners. Of this number, 81 were males, 94 females; 83 were medical cases and 92 were surgical. Of the medical, 34 were acute cases (three being trivial, the remainder involving danger to life), and 49 were chronic (of which 31 were more or less trivial, and the remainder serious). Among the severe acute cases were a case of small-pox and one of puerperal mania (in the separation wards), and a case of typhus, two of typhoid, two of scarlet fever, and three of erysipelas; the remainder comprising acute rheumatism, acute bronchitis, and the like. The serious chronic cases consisted of such affections as advanced phthisis, heart disease, Bright's disease, &c. Of the 92 surgical cases, 57 were chronic (including old strumous joints), 15 were acute, and 20 were cases of accidental injury. Among these were eight simple fractures and one compound fracture, and two operations of the selected classes, viz. an excision of the shoulder, and an amputation of the thigh for disease. There was also a case in which a portion of necrosed bone had been removed. A case of doubtful pyæmia was in the hospital at the time of visit. There were altogether in the surgical wards 41 cases of open sores.

It is perhaps worthy of notice that there was in the medical wards a case in which quinsey had originated in the hospital, and one in which rheumatism had supervened.

The mortality per cent. has been as follows, during a number of years, which are here specified. In 1840, the mortality was 8·5 per cent.; in 1845, 7·34; in 1850, 8·24; in 1855, 8·08; in 1860, 8·95; in 1861, 9·79; and in 1862, 10·44. The number of patients admitted in the latter year was 1,828, and the number of deaths 191. Unfortunately no records of the nature of cases admitted, nor of the causes of death, nor yet of operations, are preserved; and hence little of an authentic nature can be ascertained with regard to the experience of the institution. We should gather, however, from the character of cases in hospital at the time of our visit, and from the pressure there seems to be on the beds, that the cases are on the whole as severe and important as those in most other London hospitals. We were able to ascertain the causes assigned as those of death for a limited period, viz., that included between January 22d and June 3rd, 1863; and we suppose they may be accepted as a tolerably fair sample of the mortuary experience of the house. The deaths registered during the period specified were 72 in number; and of these, 62 were medical and 10 only surgical. The medical cases included 11 of tubercular disease, eight of bronchitis, six of pneumonia, four of heart disease, two of Bright's disease, and two of apoplexy. There was one case of typhus and one of variola, and one of erysipelas; there were three of typhoid, two of croup or diphtheria, and one of acute rheumatism. Of the 10 fatal surgical cases, one was a case of tetanus, one a case of strangulated hernia, three were cases of cancer, two were scrofulous cases (in one of which amputation of leg had been performed), two were cases of bladder affection, and one was stated to be syphilis.

The following is a list of operations and their results in the year 1862; amputation of thigh, four, one death; of leg, one; excision of hip, three; excision of shoulder, one; excision of knee, one (died); excision of elbow, one (died); lithotomy, three (one died); strangulated hernia, six (all died).*

We were informed that secondary diseases are rather common here. There had been lately an outbreak of erysipelas (about 14 cases having been attacked at one time, but without a death). Phagedæna is not prevalent; only one case is remembered to have occurred lately. Pyæmia is not common. Typhus has spread, and some nurses and officials were attacked, but none died. During the last three months five cases of small-pox have broken out in the house.† J. S. B. T. H.

ROYAL FREE.

THE ROYAL FREE HOSPITAL is of recent foundation, and is still in a very precarious pecuniary position. It differs from the other London general hospitals in our list in the fact of having no school of students, and from all the smaller metropolitan hospitals it is honourably distinguished by receiving patients freely, without any restrictions whatever, according to the gravity of their disease. But this salutary principle operates only in surgical cases, to which, indeed, the hospital is chiefly devoted; fever medical cases are received, on account of the large number of accidents and urgent surgical cases, which exhaust the resources of the charity; and further, the free admission of medical cases is hampered by a rule excluding all contagious diseases, under which head even typhoid fever and erysipelas are classed, although cases of each kind are sometimes taken in,

* This list of hernia operations is incomplete.

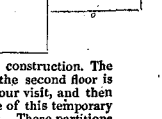
† From October to the present date (commencement of May 1864) many cases of typhus (about 60) have been admitted. During the time 3 or 4 patients have caught the disease, of whom 1 has died; 6 nurses have caught it, of whom 3 have died; and the steward also has died of it.

in violation of the rule. The in-patients are selected from the out-patients, the number of whom is enormous; and admission is afforded at all times. "All destitute applicants "receive advice and medicine, and the most urgent and destitute cases are admitted into "the wards."* The number of beds is very much below the requirements of the crowded district in which the hospital is situated, and is much below what the present building would hold if the state of the funds allowed of its being kept full. As it is, the number of beds in use is about 100; 115 can be made up; but the number varies with the state of the hospital treasury. Last year and previously the number of beds was only 84. The average daily number of patients is about the same as that of the beds; in fact the former appears to regulate the latter. It is given at 82 for the year 1862. At the time of our visit there appeared to be 42 male and 26 female beds in the general hospital, and 26 beds in the female syphilitic ward, for this is a Lock as well as a general hospital. The wards are both medical and surgical, but the two classes of patients are kept as much as possible on opposite sides of the ward. One of the wards is devoted to accidents. If erysipelas or infectious diseases break out, the cases are isolated, for which the large unused ward-space gives great facilities.

There are three physicians, five surgeons, and a dentist, a resident medical officer with two resident assistants, and two dispensers. The surgeons and physicians see out-patients daily at two o'clock, and the in-patients between one and five o'clock. There are seven nurses resident in the house (three head nurses and four assistants); three night nurses, and occasional nurses are hired. There were three of the latter at the time of our first visit, when the hospital was at its emptiest. Stimulants are largely employed, as would be anticipated from the nature of the cases and the class of patients. The expense in 1862 among 1,254 in-patients was 484*l.* 11*s.* 0*d.* for wine and spirits.

As to the method of dressing wounds, we find that here, as almost everywhere else, the conviction of the dirtiness and danger of cleansing them with sponges, used indiscriminately by the nurses, has been forced on the surgical officers by experience. Cotton wool has recently been substituted; though still in cases of operation a sponge is sometimes given, to be kept by the patient.

The building is of very simple construction (at least the part at present in use), being merely three floors, in each of which are two wards, one at either side of the stair, each occupying the whole thickness (or depth) of the block, and having therefore windows on each side along its whole length. But the wards are arranged on the plan shown on this sketch, and those on the shorter face of the block are broader and shorter than those on the longer. These broader wards (two in number) are divided partially by a wooden partition about six feet high, along which two rows of beds were intended to be placed as well as the two rows along the walls. But this arrangement has never been carried out, and so there are but two rows of beds in the accident ward (ground floor), which is on this construction. The similar ward on the first floor has not got this partition, and that on the second floor is not ordinarily in use, though it was in temporary use at the time of our visit, and then beds were arranged along the partition on both sides. But the whole of this temporary arrangement was quite irregular, and the beds were put about anyhow. These partitions are condemned, and are to be removed. These square wards, without the partitions, and containing only two rows of beds, seemed spacious and airy. Thus the accident ward B with 18 beds would contain 1,548 cubic feet of air per patient, but if the beds were arranged along both sides of the partition, in the manner evidently intended, from the shape and divisions of the partition, there would be 12 more beds, and the amount of cubic feet would be only about 900 feet, and the beds would then be very close to each other.



In the long wards there are curtains crossing the whole ward, and separating it into compartments containing two beds on each side; and in the Lock ward each two beds are separated from each other by partitions about 5½ feet high, across which curtains are drawn so as to make separate chambers of them when necessary, with two beds.

The walls are bare and comfortless, being merely the naked bricks stained, the beds and bedding rough, and everything of the cheapest kind, but substantially all seemed good, and the wards well constructed.

Want of funds prevents, as it seems, much attention to scrupulous cleanliness, and so the hospital becomes sometimes unhealthy; but, on the other hand, the same want of money obliges the authorities to keep some wards half empty and others entirely so, giving opportunities for change of ward and increased ventilation and space.

There is a small court-yard in which the patients exercise. The ventilation is by two fire-places and opposite windows in all the wards. The windows are of two kinds, broad sash windows on one side of the ward, and with three valvelike compartments on the other side; they reach nearly to the top of the ward; and there is generally a ventilator communicating with the open air in the ceiling of the window recess. The windows are opened a good deal, but not constantly, the wards being rather cold. The ventilation appears good; no hospital odour is perceived. The waterclosets are in lobbies partitioned off from the wards. They are on Jennings's principle (syphon valve), and quite free from odour. There is a bath-room to each floor, and patients are all bathed on admission.

The hospital ought, according to rule, to be whitewashed and thoroughly cleansed once every year, but want of money prevents this being done regularly. At the time of our first visit the cleansing was going on, it being two years since the last time. About

* Annual Report.

three years since, the hospital having been allowed to fall into a dirty condition, phagedæna, both of the spreading and sloughing form, appeared in all the wards, and attacked most of the cases of operation. It did not prove fatal in any case. The drainage was also bad at that time. The patients were shifted to other wards, the hospital thoroughly cleansed, and the drainage made more perfect. The disease ceased, and has not since originated in the hospital, although cases are occasionally admitted. The regulations as to the cleansing of bedding are the same as at most hospitals, and seem properly carried out.

The hospital is believed to be a healthy place of residence, but the patients are of the lowest class, and a great many of them of course unaccustomed to cleanliness or any other decent habit. Itch has lately spread in the hospital, and small-pox spread to a few cases last summer. The only other instances of the spread of disease that was heard of, besides the attack of phagedæna above noticed, was that at a time when two cases of typhoid fever were admitted (one of whom died) the nurse who attended upon the fatal case, and the night nurse of the same ward, were attacked within a week or two, and died. The nature of the disease was proved by post mortem examination.

The number of in-patients in 1862 was 1,254, and the deaths 91; in 1861, 1,190 and 86; in 1860, 1,125 and 77. The death-rate for the three years is 7·05, and for the last year 7·2. This would seem to show that the death-rate was rising, and the number of accidents seems steadily on the increase; 91 were admitted in 1860, 175 in 1861, and 324 in 1862. In endeavouring to estimate the mortality and the conclusions that are to be drawn from it with respect to the system on which the hospital is founded, it must be remembered that, as before stated, the hospital is a combination of a Lock hospital and a general hospital, that there were only 34 beds in all up to the date to which these figures extend, and that of those 24 at least were appropriated to syphilitic patients, leaving, say, 60 for the general hospital. Now the syphilitic patients would only rarely and accidentally end their days in the hospital, so that nearly the whole of this mortality would be divisible among the patients of the general hospital, in which therefore (considered as a separate institution) the cases, especially of accident, would be more severe, and the mortality greater than that of any other hospital in London. If this reasoning be trustworthy it would show how very erroneous the assertion is that the mortality * is influenced mainly if not solely by the reputation of the school to which the hospital is attached. The fact appears to be that, although the school has a considerable influence on the severity of the cases admitted, this is also influenced and very far more powerfully by the regulations of the hospital. Where a free admission is given a more acute class of cases will necessarily be selected, and where the hospital is also small, and the district which it supplies crowded and poor, this will be still more the case, especially if, as here, it receives an unlimited number of out-patients,—unlimited except by the numbers who can be received between certain hours. What is really far more influenced by the size and character of the school is the number of surgical operations. We were enabled to obtain a correct list of the number of operations, of the selected kinds, practised at this hospital during two years, July 1861–63, no correct notes existing previous to the prior date. The list is a short one, and the results very unfavourable, showing the dreadful mortality which follows primary amputations in the severe injuries occurring in crowded streets†, and to the members of the lowest class of our city population, and which also follows strangulated hernia in persons who have usually been under the care previously of unlicensed practitioners, or of the lowest class of medical men. It will be noticed also that the great majority of the operations were primary amputations and cases of strangulated hernia.

LIST of OPERATIONS for two Years, July 1861–1863.

	No.	Died.
Amputation of thigh for injury	2	2
" " for disease	2	0
" of leg for injury	5	4
" " for disease	0	0
" of arm for injury	0	0
" " for disease	1	1
" of forearm for injury	1	0
" " for disease	0	0
Excision of elbow	1	0
Strangulated hernia	6	6
Lithotomy	2	0

At the time of our second visit, when the hospital had still hardly returned to its usual condition after the repairs, there were 70 patients in the house. Of these 21 were women in the Lock ward. Of the remaining 49 patients in the general hospital, 28 were medical, of whom 12 might be classed as acute, including a case of scarlet fever accidentally in the house, and placed in a separate ward, and six as chronic or trivial. Of the 31 surgical cases, seven were accidents (including six simple fractures), 17 were acute cases, including one case of excision of the upper part of the thigh bone, one case of diffuse inflammation, and one of phagedæna (originating in both cases out of the hospital), and the other seven were chronic. There were 18 open sores or wounds. J. S. B. T. H.

* Or the average severity of the cases, which may be taken to be the same thing for the purposes of this inquiry, in which the influence of medical treatment is purposely omitted.

† It must not be forgotten that in many cases the death was really due to the complication of concomitant injuries.

ENGLISH PROVINCIAL HOSPITALS.

BIRMINGHAM GENERAL HOSPITAL.—This hospital is situated in Summer's Lane, and although originally erected out of town is now in the midst of the manufacturing districts. It lies somewhat low, in a valley through which a canal flows. There is a lawn in front, and an airing ground of about half an acre behind.

The building is an old one, and has had wings added to it; and latterly a further addition has been made, which tends to render its general plan irregular.

The original building consists (in addition to a basement) of three stories, on each of which wards are placed; and presents a central portion, with two wings extending backwards, the former being divided transversely by a corridor. On the ground floor a portion of one of these wings forms a male surgical ward with nine beds. On the first floor there are two wards (each holding 18 beds), one for female medical the other for female surgical cases. They occupy the whole length and breadth of each wing, are of good dimensions, and have windows (although placed at distant and irregular intervals) on all sides. On the second floor there are six wards, all for females, one for medical and all the rest for surgical cases. Two of them hold 13 beds apiece, and occupy about the posterior two thirds of each wing. One holds six beds, and occupies the remaining third of one of the wings. The others vary somewhat in size, containing two, two, and seven beds respectively, and are situated in the front of the central building anterior to the corridor.

The wings subsequently added have only two stories in addition to the basement. In the left wing there are three wards. One on the ground floor is the male accident ward, and holds 28 beds. It is a very large but somewhat irregular ward, with an abundance of windows on all sides. It seems originally to have consisted of three distinct wards and of other small rooms, but all have now been thrown into one; the chief indications of the original arrangement being two or three blocks of masonry in the interior of the ward, two of which contain fire-places and flues. The other two wards are on the first floor, and are used for medical cases. One of them corresponds exactly in all particulars to the one just described, but contains 31 beds; the other, which is undoubtedly the best ward in the hospital (and receives 20 beds), has been comparatively recently built out from the left anterior corner of the last ward, with which it communicates by a door. It has a fire-place in the centre, and numerous windows on three sides.

The right wing corresponds in its external form with the left, minus the last-named ward; but its internal arrangements are very different. The posterior half is cut off completely from the anterior half, and is reached by a separate entrance, and has a separate staircase. The anterior half has two wards, both of which are male surgical wards, and contain 14 and 15 beds respectively. They are of considerable size, and have windows on two sides, but are partially divided into two by a partition in which the fireplaces are situated. The posterior half is the fever house, and the house for the reception of erysipelas, phagedæna, and offensive cases, especially burns. It contains six small wards, two on each floor, presenting respectively four and six beds. The two wards on the basement are for male and female surgical patients; those on the ground floor are for male fever cases, and those on the first floor for female fever cases. Each of the wards has windows on two adjoining sides.

The wards of this hospital differ materially in their form, dimensions, and suitability for the purposes to which they are applied. The wards in the left wing, on both floors, are on the whole exceedingly good, and especially the ward which has been newly added. After these, in our opinion, stand the wards in the anterior part of the right wing, and the lateral wards on the first floor of the main building. The majority of the wards, however, are small, low, and from the form and position of the windows difficult to ventilate. The height of the wards on the ground and first floors throughout the hospital is a little more than 13 feet, on the second floor 11 feet. In the fever house the wards on the basement are only 8 feet high.

The floors are oiled and dry-rubbed throughout the house; the walls are for the most part painted up to a height of about five feet, and above that whitewashed. All the wards are heated by open fireplaces, some of which, as before remarked, are placed in the central part of the wards; and they are lighted by gas. Ventilation depends chiefly on windows, which in some of the wards are numerous, large, and well placed, but in others are small and scanty. They open by sashes, and are provided with hopper-mouthed ventilators. To aid in ventilation ventilators have been placed in the floors and in the walls or ceilings, but they are rarely employed; and in some of the large wards provision has been made for the entrance, through gratings in the floors, of air heated by passing over hot flues; but the gratings are very often closed, and even when in use the heating of the wards is not made to depend on this system exclusively.

All the wards, except the smallest, have their own water-closets. These are well drained and supplied with water, and for the most part well situated. In one of the wards on the upper floor, however, the water-closet has been made in what was doubtless originally a portion of the ward, and is very objectionably placed. There are baths in connexion with a good many of the wards, but none in the fever house. There are no regulations with regard to the bathing of patients on admission. The water supply is abundant and good. The bedsteads are of iron, and in winter have curtains. The mattresses are

ENGLISH PROVINCIAL HOSPITALS.

BIRMINGHAM GENERAL.

of straw, and there are hair beds over them. After bad cases the straw is burnt, and the hair is taken out and well purified.

The beds in some of the wards appeared close. The cubic space allowed to each is generally not less than about 900 feet. In one or two wards it is above this, but in the male wards for burns and erysipelas the space is only about 650.

There are one nurse and an assistant nurse to each of the large wards, a single nurse to each medium-sized ward, and one for each group of two or three smaller wards. There is also one head night nurse. All the above are resident; but there are in addition several non-resident night nurses. Besides the staff of surgeons and physicians, there are residing in the hospital a house physician and a house surgeon, together with four pupils.

The hospital is emptied and cleansed once a year, but is repainted and whitewashed once in three years. The fever house is whitewashed annually. At the time of visit the wards were clean and generally sweet, but some of the smaller ones struck us as being stuffy.

The treatment adopted in the hospital is chiefly stimulating and tonic. Bleeding is rarely resorted to; the cost of leeches for the year 1862 was only 10*d*. Poultices are seldom employed in the surgical wards, but water dressing chiefly. Wounds are cleansed with tow and linen, which, after being once used, are thrown away.

Patients are admitted by letter once a week, but accidents and urgent cases, which constitute about one half of the total number of inmates, are admitted at all times and without any recommendation. The patients are mostly from the manufactories in the town, but there are also a good many miners from the "black country" and agricultural labourers. The lower classes of Birmingham are generally well to do, and little given, comparatively, to spirit drinking. No classes of disease are excluded excepting primary syphilis and scabies. There is no separation of patients in the hospital, beyond what has before been pointed out, viz., that medical and surgical cases are, as a rule, separated; and that infectious cases, with erysipelas, burns, and other offensive or dangerous surgical complaints, are placed in a special and separate part of the building.

The hospital contains 20 wards, of which 9 are for males and 11 for females, and of which 12 are for surgical and 8 for medical patients. Altogether there are 226 beds, of which 133 are appropriated to males and 93 to females, and of which 134 are for surgical complaints and 92 for medical. Of the surgical beds, 10 are intended for erysipelas and the like; and of the medical, 20 are set apart for the reception of infectious cases.

At the time of our visit the hospital was undergoing its annual cleansing, and some of the wards were half empty, and others diverted from their ordinary use. It contained then 188 patients, of whom 119 were males, 69 females; and of whom 64 were medical and 124 surgical. Of the 64 medical cases about 20 (including a case of typhoid and one of scarlet fever) might be regarded either as acute or of a nature urgently requiring the special care and treatment to be obtained in a hospital; the others were chiefly made up of hysteria, dyspepsia, and such like disorders. Of the surgical patients (124 in number), 42 were acute cases, or cases in which there was actual danger to life; 39 were cases of accident; and in 58 instances there were open sores. To go more into detail, there were in the wards 14 simple fractures, 1 compound fracture, and 3 cases of burn; there were 2 amputations of the arm for accident, and 2 pathological amputations of the same part; 4 pathological amputations of the thigh, 1 primary and 1 pathological amputation of the leg, 2 cases of herniotomy, 1 case of lithotomy, 1 of excision of the elbow, and 1 of ligature of the femoral artery. In one of the above cases pyæmia had set in, and in one erysipelas had appeared. It would seem from the enumeration just made that the cases in the hospital, and more especially the surgical cases, were of considerable severity.

On looking to the statistics of the hospital we find that in the year ending June 31st, 1862, 2,085 cases were admitted into the hospital, and 2,056 (including 206 deaths) quitted it. The per-centage of deaths was therefore 10·2. The average daily number of patients in the house was 206. Medical and surgical complaints have not been separated in the report, and although such a distinction might to some extent be effected now, it could only be done roughly, and would have little value. It is clear, however, that the great majority of admissions were surgical, for 701 were cases of accident, and probably not more than half the remainder consisted of medical cases. The examination of the post mortem records, which are imperfectly kept, shows that between 80 and 90 of the deaths were in medical patients, and that the greater number, therefore, were surgical. In the year referred to we find that of the medical cases admitted for treatment 55 were cases of typhoid fever and 39 of acute rheumatism, 18 of pneumonia, 36 of pleurisy, 12 of croup, 29 of bronchitis, 89 of phthisis, 43 of disease of the heart, 25 of renal disease, and 12 of anasarca after scarlet fever. On looking to the surgical cases admitted we see that there were among them 97 cases of burns and scalds, 19 cases of fracture of the skull, and 21 of concussion, 7 compound fractures of the upper arm, 3 of the forearm, 7 of the thigh, 13 of the leg, and 6 of the foot, together with 42 simple fractures of the thigh and 118 of the leg. There were also 14 cases of calculus vesicæ and 17 of strangulated hernia. 23 cases of phagedæna are given in the report, but whether they were cases of patients admitted with the disease is not expressly stated.

The records of death seem to correspond with the above statement: thus there were in the year a good many deaths from fever, phthisis, and croup; and from affections of the heart, lungs, and kidneys; and also a very large number of deaths resulting from burns, smashes, compound fractures, and several from strangulated hernia.

The following is the list of operations of the class selected for comparison, for a period of 3 years:—

	Total.	Died.
Amputation of thigh for injury	14	8
Amputation for disease	22	4
Amputation of leg	42	11
Amputation of arm	12	5
Amputation of fore-arm	19	0
Excision of knee	15	4*
Excision of elbow	9	2†
Hernia	39	19
10 Years.		
Lithotomy, up to 15	71	5
" above 15	32	5

Pyæmia and phagedæna are said to be of frequent occurrence, but no accurate record of operations is kept, and there is therefore nothing by which the exact truth can be ascertained. The imperfect records of death which we have consulted show two or three entries of pyæmia for the year ending 1st June 1862, and seven in the course of the year which has just elapsed. A severe outbreak of phagedæna happened in the year 1862; from 80 to 100 cases broke out, but very few were fatal. The disease was of the spreading form. It is said to have been common in the town at the same time. The disease was met by partially emptying the surgical wards, by doing away temporarily with the distinction of medical and surgical wards, by removing the cases of phagedæna to special wards, and by attending carefully to cleanliness.

It should be mentioned, that, in calculating the per-centage mortality of the institution, we have, with the aid of the resident medical officer's returns, carefully excluded all the renewed tickets, which in the report are reckoned as additional patients; the number of these tickets in the year we have specially quoted was 527. Patients' tickets are renewed after a residence of six weeks.

J. S. B. T. H.

BIRMINGHAM QUEEN'S.

BIRMINGHAM QUEEN'S HOSPITAL.—The Queen's Hospital at Birmingham is a new institution, and has only been in operation a few years. It is situated in one of the best parts of the town, in an elevated situation, on a sandy soil, nearly on the outskirts of the town itself, and has good water supply and drainage.

The institution is supported by the contributions of a body of subscribers, and seems at present under the necessity of making urgent appeals for public support. The subscribers have, therefore, the power of granting letters; but the managers of the hospital appear to be aware of the objections attendant on that arrangement, since they make it a cause of congratulation in their report that the hospital is in many respects a *free hospital*, since nearly as many cases are admitted without letters as with them (Report, 1860–61, p. 16, note). No class of cases are excluded, except that old sore legs, the advanced stages of dropsy, and phthisis, and other cases thought to be incurable, are not taken in. Fevers, small-pox, and any diseases reputed contagious are placed in a detached fever house.

The hospital is built round three sides of a rectangle, enclosing a rather narrow court. Behind this is a good space of ground laid out as a bowling-green, and at the bottom of this green is the fever house. The wards in the main building are mostly small, containing on the whole about 18 beds each, but subdivided into two by a central part, in which the baths, scelleries, and water-closets are placed. The fever house is in the form of the letter H, the two longer limbs of the H comprising the principal wards; these are three in number, two on the ground floor, and one on the first floor. One of these ground floor wards is a male surgical, the other two large wards receive cases of fever; but if there are not enough cases of fever to fill them other medical cases are admitted. There are also small wards in the transverse limb of the H, and over the large ward on the ground floor, for special cases (such as small-pox), and for burns, and for female syphilis.

All the wards seemed airy and well-ventilated. The only means of ventilation are the doors, windows, and fire-places, with a few ventilators in the roof, and lattice panes in the windows. The windows are kept open to a certain extent at night as well as by day. The cubic feet of space per bed in most wards seems to vary from 800 to 1000 feet.

The class of cases admitted appears to be acute, both on the medical and surgical side. This is evidenced by the proportion of typhoid fever and pneumonia among the former, and of grave operations among the latter, as will be stated further on. The fever cases are placed in a ward by themselves, and there is a separate accident ward, and another separate surgical ward; but in the greater part of the house, medical and surgical cases are put together. There is also a separate children's ward.

The cases are said to do very well here. The death-rate over all the cases seems to be about 8·7 per cent. Acute medical cases like typhoid fever and pneumonia are reported as generally proceeding favourably. Operations are usually successful, and secondary surgical affections rare. Two years ago there was a little sloughing phagedæna, lasting

* One after amputation, included also in amputation of thigh for disease.
† One primary.

for about six weeks; but the greater number of cases under treatment originated out of the hospital.

As to the operations it appears that in the classes of operations which we have selected the following were the results during the year ending June 30th, 1862:—

	No.	Died.	
Amputation of the thigh for disease	2	—	
,, leg for injury	2	—	
,, ,, disease	5	2	
,, arm	1	1	Visceral disease.
,, fore-arm for injury	1	—	
,, ,, disease	2	—	
Excision of knee	1	—	
,, elbow	1	—	
Lithotomy	2	1	
Strangulated hernia	4	3	

BIRMINGHAM QUEEN'S.

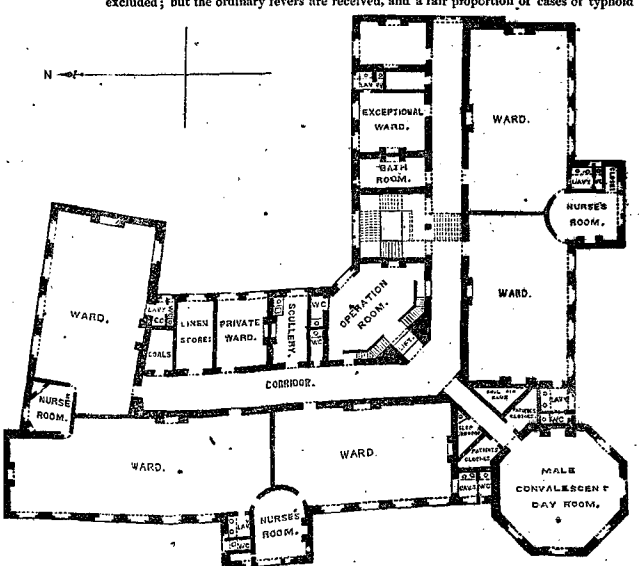
It may be also mentioned that during the same period six operations of ovariotomy were performed in the hospital, with success in three cases. At the time of our visit a case was under treatment in one of the wards (but with no other patient in the same ward), which was doing very well. This fact seems to prove the healthiness of the hospital for surgical purposes.

At the time of visit there seemed to be 135 beds made up in the whole house. There were 78 patients; 30 were medical, of which as near as possible half were acute, and half chronic or trivial. Of the 48 surgical cases, 16 were accidents, including 2 compound and 4 simple fractures, and 2 burns, 14 were acute cases, including 1 amputation of the leg for disease, 1 excision of the hip, 1 excision of the shoulder, 1 excision of the elbow, and 1 ovariotomy, also 1 case of inflamed absorbents originating in the hospital; 18 cases were chronic. There were 21 cases of open wound or sore.

J. S. B. T. H.

BRISTOL GENERAL.

BRISTOL GENERAL HOSPITAL.—Of the two hospitals connected with the Medical School at Bristol, the General Hospital is the smaller and the more modern. It was built only a few years since. It is on the outskirts of the town, close to the river and the docks. Admission is by letter, and on emergency; but the letter system does not seem to be so strictly enforced as it is in many hospitals, since out of 1168 admissions in 1862, 501 were without letters. Exanthematous fevers and primary syphilis are excluded; but the ordinary fevers are received, and a fair proportion of cases of typhoid



fever are generally in the house. Both the medical and surgical practice are said to comprise a good many cases of acute disease. But "phthisis and other incurable cases" are excluded by the rules, and these are it seems tolerably well attended to.

The plan of the hospital has been in a great measure dictated by the small space at the command of the architect. It will be understood from the accompanying sketch. The general shape of the building resembles the letter L. The principal front faces the river, looking southwards, and has a small quay in front of it, which is raised over some warehouses on the river's bank, and made into a garden for the patients' exercise. The outside of the L is occupied by the wards, which are provided with a plentiful window space, and well exposed on their chief front, looking over the river and the docks; but the opposite (or inside of the L) is occupied by a corridor and various offices, with one or two small wards, so that the chief wards have not thorough ventilation.*

The small upstroke of the L is occupied by another ward, not exactly parallel to the chief face of the hospital, in consequence of the direction of the street on which it abuts. The angle of the L is made into an exceedingly cheerful pleasant dayroom for convalescent patients, which is much used and liked. The water-closets are most of them placed in projections outside of the main building, so that their drainage is carried directly away. The first and second floors only are used as wards, the former for females, the latter for males; accidents and other cases which require it being hoisted by means of a lift. There are on the whole 12 wards, of which three are small, and only hold two beds each; the others contain from 11 to 17 beds, making on the whole 190, including 12 children's cribs. The wards are lofty and of good proportions. The cubic space per bed in the large wards on the second floor is about 1100 feet. One singular feature in the wards here is that they have stucco floors,† which at present are uncracked, and look bright and very clean, though comfortless. They are said to be cold in winter, but no practical inconvenience is experienced.

The ventilation and warming of the wards is assisted by an apparatus, consisting of a shaft in the garden from which air passes into the basement, where it is passed over a series of pipes heated with hot air into a chamber, and thence into each ward; at the upper parts of the wards there are shafts for the foul air, communicating with a tower, in which the air is raised by contact with heated flues, and thus drawn out of the wards. This system was originally intended to replace open windows and open fire-places altogether; but after a short trial it was found that the hospital was becoming infected with erysipelas, and therefore, at the representation of the medical staff, the scheme was abandoned; at least it was only retained as an adjunct to the above-meationed more powerful agents, and an adjunct on which, if we understood rightly, they did not set much store.

The hospital seems constantly almost full. The average in 1860 was 109; in 1861, 110; and in 1862, 114; a high rate for 130 beds. At the time of visit there were 117 medical and surgical patients, occupying separate wards. The children's cribs are placed in the women's wards. Cases of exanthematous fever, admitted by mistake, or occurring in the hospital, as also those of erysipelas, are removed into the small wards.

The practice of this hospital seems very successful, as far as the records kept enable us to judge. The death-rate was in 1860, 5·4 per cent.; 1861, 6 per cent.; 1862, 4·96 per cent. Secondary surgical complications are rare. Simple erysipelas shows itself sometimes after operation, but is never fatal. Phagedæna has not been known to arise in the hospital, and pyæmia is very rare; only two cases are remembered in as many years.

Surgical operations in general do well. There appears to be a fair number compared to the size of the hospital. We have been favoured with the following list of the operations selected for comparison, from June 1st, 1861, to October 21st, 1863:—

	No.	Died.	
Amputation of thigh for accident -	2	—	
" " for disease -	13	2	
" leg for accident -	2	2	(1 double amputation)
" " for disease -	3	—	
" " at ankle -	4	1	
" arm for accident -	1	—	
" fore-arm for accident -	1	—	
" " for disease -	1	—	
Excision of the knee - -	5	1	
" elbow - -	4	—	
Lithotomy - - - -	2	1	
Strangulated hernia - - - -	3	—	

We have been able to obtain the list of deaths for only the first half of the year 1862, during which time 554 cases were admitted, viz. 224 medical, and 310 surgical. The deaths in that period were 26, viz. 17 medical and 9 surgical. The medical we should divide thus:—

Visceral and chronic disease -	7
Acute - - - -	8
Cancer - - - -	2

Of the 9 surgical, 3 were accidents, 5 cases of acute disease or surgical operation, 1 chronic. None are attributed to pyæmia or other secondary complication.

* Let the reader compare this plan with that of the Sheffield Infirmary, p. 618.
† Compare the account of the Lincoln County Hospital.

BRISTOL GENERAL.

At the time of visit (August 22nd) there were 44 medical cases, of which 19 might be classed as acute and 25 as chronic. On the surgical side there were 73 patients; of whom 21 were accidents, comprising 10 simple and 1 compound fractures, and 2 burns and scalds. The acute cases were 15 in number, comprising an unusual number of the greater operations; *viz.*, 2 excisions of the elbow, and 1 of the knee, 2 amputations of the thigh, and 1 of the leg. (All these operations were done on account of disease.) The rest, 37 in number, were chronic cases. There were 24 open sores, many of a trivial nature.

In considering the success which is claimed for this hospital (and which we have no reason to doubt), we must remember that there are several circumstances favourable to a healthy condition and low mortality. On the medical side, as, on the one hand, the very gravest cases of acute disease (the exanthematous fevers) are excluded, so that the list of deaths is not swelled by the results of small-pox or scarlet fever; so, on the other, incurable cases and phthisis are also excluded, at least by rule. It is true that this rule is not very strictly observed, since cases of phthisis were noted in the wards, and it stands pretty frequently among the causes of deaths, still the existence and partial observance of the rule probably has its influence.

On the surgical side it appears (if we can take the state of the house at the time of visit as a fair criterion) as if the type of accidents was not very grave (few compound fractures or burns), nor the proportion of acute cases large. On the female side especially the cases seemed very slight. The large number of operations in the wards must have been accidental, since if it had been the usual condition of things there would have been a longer list to show as the results of two and a half years' practice.

Still the almost total immunity of this hospital from pyæmia is an interesting subject of inquiry, and the reader will find it spoken of in the body of the Report, under the head "Construction of Hospitals," page 493 and elsewhere." J. S. B. T. H.

BRISTOL ROYAL.

THE BRISTOL ROYAL INFIRMARY is an old building. It is much larger than the other hospital at Bristol; but the students of the school of medicine there, who are not at present very numerous, partake of the practice at both, and attend at either as they please.

The number of beds at this hospital is about 242, and the house is kept tolerably full; the average for the past year (1862) being 208.* The number of patients admitted was 2,581. The deaths 145, giving a death rate of 5·6 per cent.

The rules oblige the applicant to produce a recommendation from a subscriber, and in case of his coming from a distance they require this recommendation to be accompanied by an undertaking for his expenses of removal.

The diseases excluded appear to be (as at the Bristol General Hospital) the exanthemata, syphilis, and itch.

The beds are about equally divided between medical and surgical cases, and the class of medical cases admitted appears sufficiently acute. We were able, by going over the list of admissions for the first half of the year 1862, to select out of 619 medical cases a total of 156 of the acute type which recovered, and out of 50 cases which died, 23 at least appear to have been cases of acute disease.

We shall therefore probably be not far wrong in saying, that the practice of medicine at this hospital presents nearly as large a proportion of acute cases as do the metropolitan hospitals, excepting the exanthemata; on the surgical side, the cases of disease appear chiefly chronic. Operations seem to do very well, and secondary affections to be rare, very little erysipelas or pyæmia, and no hospital gangrene.

Of 60 deaths occurring amongst the surgical patients in 1862, 31 were due to the direct results of accident, 24 to acute disease or to operation, and 5 to chronic complaints.

The number and the result of surgical operations from January 1st, 1861, to April 29th, 1863, since which time the account is not made up, is as follows:

Amputation of the thigh	-	For injury	- 2.	2 died.
		„ disease	- 6.	
„ leg	-	For injury	- 2.	1 died. 1 double amputation and other injuries.
		„ disease	- 4.	
		„ „ at ankle	4.	
„ arm	-	„ injury	- 5.	1 died.
		„ disease	- 2.	1 „
„ forearm		„ injury	- 2.	
		„ disease	- 3.	
Excisions	- -	of knee	2.	successful.
„	- -	of elbow	3.	1 unsuccessful; not fatal.
Stone	-	Median operation	10.	1 died. All children.
Hernia	- - -		6.	3 died. 1 not recorded.

In one of the fatal cases pyæmia is noted, and in one of those who recovered erysipelas. The causes of death are not given.

* There are regularly established 236 beds in the main wards, and there are four attics in which 16 beds can be made up; also small rooms near the operating theatre for the accommodation of one or two special cases. The attics are constantly occupied, but seldom or never full. The other rooms are seldom tenanted.

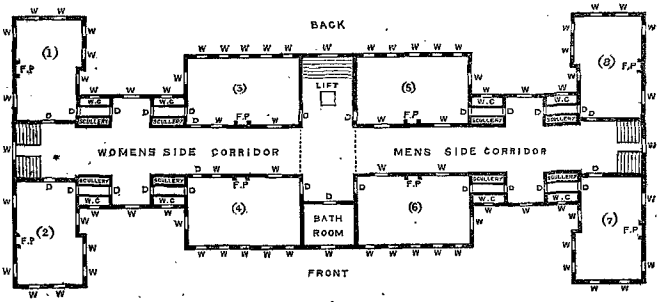
In another of the surgical cases of death, it seems likely that pyæmia might have been the real cause, but it is not expressly so stated.

The per-centage of deaths is in medical cases 6·7, and in surgical 5·7.

Thus it appears that the hospital admits a moderate number of acute cases, and that a fair proportion of surgical operations are performed here; also that the wards are more free from secondary surgical affections than is the case in most hospitals in the metropolis; and that the hospital generally is healthy.

Is there anything in the construction of the hospital to account for this (presumed) greater salubrity? We cannot see that there is. The building is an old one. The plan will show its general arrangement. The building is symmetrically arranged, on either side of a corridor which runs down its centre. There are two floors entirely appropriated to wards; viz. 1st and 2nd, and containing each eight wards; also two wards on the ground floor, some garrets, and private wards on the second floor. The wards in the centre of the hospital are ventilated on one side only into the outer air, and on the opposite into the corridor. Those at the end have windows on three sides. In all the wards the windows are constantly kept open, some at night as well as by day. The cubic space per bed is about 1000 cubic feet; but from the construction of the wards the beds are crowded together, being nowhere more than 1½ feet apart.

BRISTOL ROYAL.



BRISTOL ROYAL INFIRMARY.—1st Floor.

The corridors, it should be observed, are very airy, and at the time of visit the whole house seemed extremely fresh and free from any unpleasant odour; but on the whole we are unable to see in the construction of this hospital anything likely to exempt it from hospital affections; rather we should regard such an exemption as being only procured by unwearied attention to obviate, by the free admission of air, and the exertion of rigorous cleanliness, the evils which the want of thorough ventilation would otherwise entail.

We believe that the comparative immunity from hospital affections depends rather upon the lighter nature of the surgical cases, and the exemption of the wards from a "traumatic atmosphere," aided possibly by local influences, and by the more healthy constitution of the patients, compared to those in metropolitan hospitals.

On the day of visit there were 185 patients, of whom 85 were medical. These comprised 40 acute cases, including numerous cases of typhoid fever. Out of the 100 surgical cases, 20 were accidents, including 6 simple fractures, 4 compound fractures, and 4 burns. 21 were acute cases, including 1 of erysipelas originating in the hospital. There were none of the selected operations. The rest of the cases, 59, were chronic or trivial. The open wounds or sores were 41 in number. J. S. B. T. H.

HULL GENERAL.

HULL GENERAL INFIRMARY:—The town of Hull, on the banks of the Humber, lies for the most part low, on a clay soil, and is hence damp. The greater part of it, including the hospital site, is well drained. It contains a large poor population, many of whom are sailors, shipwrights, and labourers engaged in cotton mills, linseed oil and cake mills, lead works, &c. The hospital itself is in the centre of the town, and in one of the poorest and most populous districts. It stands on about two acres of land, of which a portion is in front of the hospital, and a larger portion, used as an airing ground for patients, is behind.

The hospital is an oblong block of three stories (with an annexe at the back of its left extremity), and is built on the corridor plan. The general arrangement of the interior is this:—there is a long corridor extending nearly from one end of the building to the other, terminating, however, at each end, in a staircase, beyond which is one ward occupying the whole depth of the building. In front of the corridor, in its whole length, and extending from one terminal ward to the other, is a linear series of wards. Behind, there is comparatively little to interfere with the direct lighting and ventilation

of the corridor. From the centre of the corridor a staircase with bath-rooms on either side projects backwards, and from the left extremity of it the left new wing stands out. The remainder of the corridor is entirely free.

The wards occupy the first and second floors, are 18 in number, and contain mostly from 8 to 10 beds apiece. Some of the smaller ones, however, hold only from three to five beds. The largest wards are those in the annexe. The height of the wards on the first floor is 14 feet, of those on the second floor 12 feet, and the cubic space per bed varies between 1120 and 740 feet. The beds appeared to us to be too close together. The wards at each end of the building have thorough ventilation, and those in the new part have windows on two contiguous sides; the remaining wards have them on one side only. The windows generally are ordinary sash windows, but they have fixed to the frame in front of the upper part a tranverse plate of perforated zinc, through which the air has to pass when the upper sash is slightly opened. In addition to windows, some of the wards have window-spaces opening into the corridor, and all have ventilators in the upper part of the wall or in the ceiling. It may be mentioned that a ward on either side the chapel communicates with it by a window, which allows the patients therein to share in the service without leaving their beds. Open fire-places are universally employed for heating, and gas for lighting. The walls are generally whitewashed, and the floors scrubbed; but in one of the wards in the new part the walls have been recently painted, and the floors oiled, by way of experiment. The wards are scrubbed once a week, and the hospital thoroughly cleansed and whitewashed once annually. There is a water-closet on each floor in the new building, approached by a passage; and there are two other closets on each floor, for the general use of the patients, which open out of the corridor. There are also four bath-rooms, two on each floor. The water-closets seem to be well arranged and well supplied with water, but had a strong smell. The bedsteads are of iron; the mattresses generally flock, but some are filled with seaweed.

The nurses are 10 in number, and resident; 4 of them are head nurses, 4 assistant nurses, and 2 night nurses. There are 2 physicians and 3 surgeons attached to the hospital, a house surgeon, and a dispenser. As regards treatment, bleeding is occasionally resorted to, and stimulation is moderate.

Accidents and emergencies are admitted on application; but other cases are expected to apply on the weekly admission day, and to be provided with a governor's letter. The cases excluded by rule are those of women advanced in pregnancy, children under six, persons of unsound mind, persons afflicted with incurable or infectious diseases, and persons also supposed to be in a dying condition. But, as generally happens in towns like Hull, such rules are necessarily frequently infringed; cases of typhus and of typhoid, for example, are generally admitted. Patients come, not from Hull only, but from the country districts around; and comprise sailors (foreign and English) and town and country labourers. Foreigners indeed form a considerable proportion of the patients (about 18 per cent.) To show how far the letter system operates, it may be mentioned that in 1859 133 were admitted as accidents out of a total of 1,025; and that, as a rule, medical cases are only admitted by letter.

The hospital contains 147 beds, of which 93 are for males and 54 for females. The medical and surgical cases are to a considerable extent separated, but not entirely, so that the exact proportion between the beds allotted to the two branches of practice respectively cannot be stated accurately. At the time of our visit, however, there were 35 medical and 65 surgical cases in the house; and in the year 1862, 458 medical and 533 surgical cases were admitted. There are eye wards, but no special separation beyond this, unless erysipelas or some contagious affection requires isolation. It may be mentioned that there is an old building in the rear of the hospital, which has been used for the reception of small-pox and other cases; and to this such cases might even now be removed.

The number of patients in the house was 100, of whom 63 were males, 37 females; and of whom 35 were medical, 65 surgical cases. Of the medical cases 13 were acute, and 22 chronic. The acute comprised 4 trivial cases, and 9 severe (among which were 3 cases of acute rheumatism, a case of typhoid, one of jaundice with delirium, and one of erysipelas). The chronic comprised 11 simple and 11 serious cases (the latter being made up of phthisis, heart diseases, and other organic affections). Of the 65 surgical cases, 19 were cases of accident, 14 were acute affections, and 32 chronic. The cases comprised 25 open wounds, 5 simple and 2 compound fractures, a case in which erysipelas and gangrene had supervened on some injury to the foot, and 3 operations of the kinds selected for comparison; viz. one case of Syme's amputation of the foot for disease, and 2 cases of amputation of the arm (one for accident and one for disease).

The average number of patients in the house daily during the year 1862 was 90; of medical patients 32; of surgical 57. The mean residence of each patient amounted to 28 days.

In the year 1861, 1154 patients were admitted, of whom 84 (or 7·2 per cent) died. In the year 1862, the admissions were 971, and the deaths 69, and the mortality therefore 7·1 per cent. In the latter year the number of medical cases admitted was 438, the mortality 38, and the death-rate 8·6; the number of surgical admissions was 533, the mortality 31, and the death-rate 5·8. The per centage mortality among females was almost exactly half of that which was presented by males.

As regards the nature of cases admitted, the records are far from complete. We are informed, however, that the medical cases are chiefly chronic bronchitis, phthisis, and rheumatism; but that acute cases are not altogether infrequent. Many of the most serious cases are those of sailors. In some papers on vital statistics by Sir Henry

Cooper it is shown that during a period of 10 years 6 per cent. of the cases admitted were cases of fever, 8 per cent. cases of pulmonary affections, and 9 per cent. cases of rheumatism. Of the surgical cases probably one fourth are cases of accident; the remainder comprising an average proportion of acute and of chronic cases.

The causes of death, however, are fairly kept, and from them we gather that out of the 69 deaths recorded in 1862 there were among the medical cases 6 due to phthisis, 13 to cardiac disease, 2 to chronic bronchitis, 4 to fever, 2 or 3 to other acute diseases, and the remainder to various chronic visceral complaints; and among the surgical cases, 9 were the result of accident (including 2 burns), 2 were cases of herniotomy, one was a case of vesical calculus, in which death resulted from typhus, two were cases of exeision of the elbow, in one of which gangrene had ensued, and 2 were cases of gangrene of the foot, for which amputation was performed. Among the 84 deaths which occurred in 1861 were 18 cases of phthisis, and 22 cases of accident (including 9 burns), and a case in which amputation at the shoulder had to be performed. There were besides these 2 fatal cases of lithotomy (one in the adult), a fatal case of herniotomy, a fatal case of ligature of the femoral artery, and five cases in which erysipelas was either the primary or a secondary disease.

Erysipelas, we were informed, occasionally arises in the hospital, and occasionally spreads; phagedæna is very rarely seen, and pyæmia is believed to have occurred once only in five years. Fever is said not to spread; but it will have been remarked that a case of calculus vesicæ is returned as having died from fever; and in the cholera epidemic of 1849, although cholera cases were excluded from the house, 5 or 6 cases broke out in it, and one of the nurses died.

Judging from the character of cases in the house at the time of our visit, and from the records of deaths, we should suppose that the cases admitted differ not very greatly from those admitted into metropolitan hospitals: there would seem to be a not inconsiderable number of grave accidents and of important operations. The number and details of these latter we have been unable to obtain, but there has evidently been some mortality among them.

The hospital itself has the defects and advantages (whatever they may be) which belong to the combination of the corridor system, with small wards.

J. S. B. T. H.

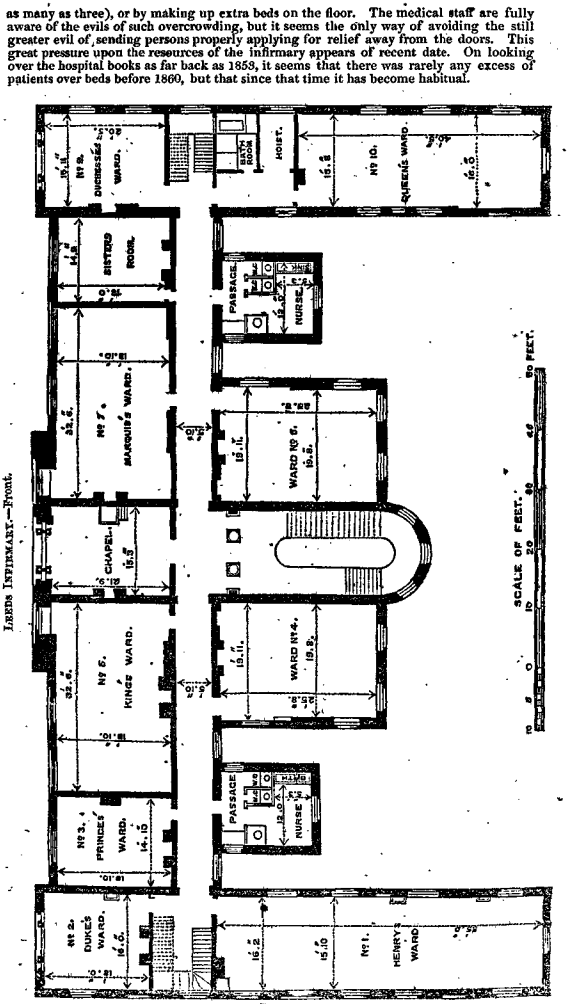
LEEDS GENERAL.

THE LEEDS GENERAL INFIRMARY can hardly be classed as a country hospital. It is one of the hospitals attached to provincial schools of medicine, and is a well-known surgical school. In being situated in the centre of a large urban population, and having an old established surgical reputation and a school of pupils, by which means it draws to itself a large number of acute cases, it resembles the metropolitan hospitals; but it differs from them in one and that the most important particular, viz., that it does not admit cases of disease reputed infectious, including under that term all the exanthemata, typhus and typhoid fever. It does appear, however, that cases of the last-named disease, if accidentally admitted, are sometimes retained.

We make the above observations at the outset of our account of the Leeds Infirmary, because some confusion has arisen from classing together all hospitals out of London under the name of "country hospitals," and contrasting certain results of practice in them with those of similar practice in the metropolitan hospitals. We are not wishing to deny that such comparisons may be useful; but it should not be forgotten that hospitals like this at Leeds have much more resemblance in all essential features (except as before stated in the nature of the medical cases admitted) with such metropolitan hospitals as adhere to the system of weekly admission by letters than to the country hospitals, strictly so called.

The present building is inadequate to the wants of the town, and is to be replaced by a new hospital, which is at present in course of erection, on a plan somewhat resembling the Hôpital Lariboisière. *See* the "Builder," Feb. 13, 1864. It may therefore be permitted to us to dwell on some of its defects, as far as they illustrate the subject which we have in hand, viz., an attempt to determine the chief causes which act favourably and unfavourably on the healthiness of hospitals. The chief drawback to the helathiness of this hospital is that it is overcrowded. We have numerous occasions, in the course of these observations on hospitals, to remark, that in the great majority of our smaller country hospitals the average number of patients is very far below the number of the beds; and that the same is the case in the London hospitals, though to a less extent. This is presumably a cause of healthiness in such institutions; for as there are always or nearly always a certain number of beds vacant in each ward, the real cubic space per bed is greater than the calculated allowance, and, as far as this affects the salubrity of the ward, the patients have all the benefit of it. On the other hand, in the Parisian hospitals it appears that the beds are kept almost all full; and this may, with much probability at least, be reckoned among the numerous causes which militate against the healthiness of those hospitals. But at Leeds alone among the hospitals which we have visited is it necessary to keep the population of the hospital constantly in excess of the number of beds. We have made a careful inspection of the hospital books for the year 1862, showing the number of in-patients for each week. We find that during the whole year the minimum number of patients (which was reached only in two weeks of the whole latter half of the year) was precisely the regular number of beds in the house, viz., 138, while the average for the last six months of the year was 166, and at one time, earlier in the year, a still higher number was reached, viz., 204. This excess is provided for in one of two ways, either by putting more than one patient in a bed (in some very crowded times

as many as three), or by making up extra beds on the floor. The medical staff are fully aware of the evils of such overcrowding, but it seems the only way of avoiding the still greater evil of sending persons properly applying for relief away from the doors. This great pressure upon the resources of the infirmary appears of recent date. On looking over the hospital books as far back as 1853, it seems that there was rarely any excess of patients over beds before 1860, but that since that time it has become habitual.



The other great fault of the hospital is its antiquated construction and deficient ventilation. A reference to the plan will show this to a certain extent. It will be noticed that the house is built on either side of a corridor running parallel to the principal face of the building, and that no part of the wards enjoys the benefit of free exposure on opposite sides to the air, except the ends of wards 1 and 10 and those over them. But the plan cannot show the narrowness, darkness, and want of air which this old building exhibits on a personal visit. The wards are small compared to the number of beds regularly in them, giving in some wards only 800 cubic feet to a bed, and generally between 900 and 1000; and this average exceeds the reality, when, as is almost always the case, there are extra beds in the ward.

Such being the state of things, it is not wonderful that erysipelas, phagedæna, and pyæmia, are very prevalent in this hospital, and such no doubt is the case. The overcrowding and the grave nature of the accidents admitted* are sufficient to account for much of this; but it appeared to the medical staff to be aggravated by three other causes, which they have accordingly endeavoured to remove. In the first place, the ventilation being insufficient, under the ordinary plan, of having the windows open only occasionally, it was determined to keep them always open. Accordingly, for the last two years every window has been left open for half an inch at least constantly day and night. In the next place, the wards used to be warmed with stoves; these were thought to vitiate the atmosphere, and therefore open fires have been substituted. Thirdly the floors, which are very old, used to be mopped. It was believed that the water lingered about and kept the wards damp, and so encouraged erysipelas. Hand-washing and immediate drying was substituted. These measures appear to have been successful, as far at least as success could be obtained before going to the root of the matter, and building a hospital adequate to the wants of the place. It appears the unanimous opinion of the staff of the hospital that these secondary diseases have become less common since the measures we have indicated were carried out. At any rate, under all these disadvantages, the surgeons of the Leeds Infirmary carry on a surgical practice which (judging by the best test we can obtain, viz., the success of the greater operations,) appears more successful than that of London, and far more so than in the magnificent hospitals recently constructed at Paris. The reason of this difference is a very interesting subject of inquiry. No special exemption from pyæmia, erysipelas, and hospital gangrene can be claimed for the climate of Leeds. We have shown already that such affections are ready enough to develope themselves here under favouring circumstances. The class of patients received, though probably less given to intemperance than the London poor, and perhaps of hardier constitutions than those of Paris, and better off than in either city, are yet an urban population accustomed to confinement and hard work in close air. Allowing that the vigorous constitution which is popularly ascribed to the Yorkshire artizan may have something to do with it, we cannot resist the conclusion that the main causes to which the result is owing are the liberal supply of fresh air, the free allowance of good diet and stimulants†, and the inartificial method of dressing wounds.‡ If the system of treating patients in wards with closed windows, ventilated artificially, were adopted here, and, still further, if the numerous open wounds and offensive sores were treated by methods which foment them and encourge suppuration, we have no doubt that the hospital would have become a hotbed of erysipelas and hospital gangrene, and the practice of surgery would have been long since found impossible here, at any rate upon its present scale.

We have dwelt thus at length upon this matter because it seems to us the chief point of importance to notice in this hospital. In other respects it differs but little from others of the same class. The great pressure upon the beds does, it is true, probably modify to a certain extent the effects of the system of admitting weekly by letters and excluding fevers, so far as to make the type of medical cases more acute than in most hospitals where those regulations prevail, but of this we have no certain proof, since the reports do not state the causes of admission.

We append particulars, gathered partly from the hospital books, and partly from our visit to the infirmary.

At the time of visit the beds were reduced to the nominal number of 130, by a ward being closed for whitewashing. There were 136 patients in the house; a state which was regarded as less crowded than usual. Of these 43 were medical.

Of the 93 surgical cases, 38 were accidents, including 8 simple and 6 compound fractures, and 4 burns. 27 cases of the cases of surgical disease are classed as acute; 28 as chronic. There were 53 patients with open sores in the wards. There were two cases of hospital affection (one of erysipelas and one of diffuse inflammation). Of the operations selected for comparison there were the following: one amputation of the thigh, one of the leg, one of the fore-arm, one femoral hernia, one lithotomy in a child.

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* Such accidents as compound fractures, lacerations, and burns are very common in consequence of the great number of factories, &c.

† The cost per patient has risen from 1*l.* 11*s.* in 1850 to 2*l.* 8*s.* 6*d.* in 1862.

‡ The method of dressing wounds here is very different now from what it used to be. Nothing can be more simple than the present system of dressing; water dressing chiefly to wounds; sand bags and pillows instead of splints in most cases of fracture; for offensive sores, Condy's solution or creosote. With this simple treatment many cases of compound fracture of the thigh have been cured which under the old system of minute careful daily dressing and splinting would have been lost. We are quoting the sentiments, if not the words, of a gentleman who has been surgeon to this hospital for half a century.

APPENDIX.

No. 15. *The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.*

The following is the summary of 78 deaths included in the post mortem book.
31 were surgical. Of these there were of—
Surgical operation, 12; complicated in 5 cases by hospital affections.
Acute disease 9 " 5 " "
Injury 8
Chronic disease 2
Of the 47 medical cases there were of—
Chronic and visceral disease - - - - - 30
Acute medical affections - - - - - 12
Cancer - - - - - - - 5
The death-rate for three years, 1860-62, was 6·1 per cent.

ENGLISH PROVINCIAL HOSPITALS.

The operations are given in the following list:

LEEDS.

Numbers and results of amputations during a period of three years, from 1855 to 1858, extracted from "Teale on Amputations," compared with a similar period, 1860, 1861, 1862, from the annual reports of the hospital. The methods of amputation are the same, viz., rectangular flaps, except under special circumstances; but the ventilation &c., has been improved in the later period, as stated above.

AMPUTATIONS.	1st Period.			2nd Period.			REMARKS.
	No.	Deaths	Per Cent.	No.	Deaths	Per Cent.	
Thigh -	20	4	20·0	31	7	22·0	This does not show a very striking diminution; but the results of the past year, 1862, taken alone, are very favourable. Out of 29 such amputations, taken all together, only two have died.
Leg - -	40	4	10·0	29	3	10·0	
Arm - -	11	5	45·0	15	5	33·0	
Fore Arm -	9	2	22·0	19	1	5·3	Thigh " - 8 - no deaths. Leg " - 12 - 2 " Arm at shoulder 2 - no deaths. Fore Arm - 7 - " "
Total -	80	15	18·7	94	16	17·02	

In the three years 1860-61-62 there were—
13 cases of lithotomy (ages not given) - - - 1 death.
21 " herniotomy - - - - 8 deaths.
J. S. B. T. H.

LIVERPOOL SOUTHERN.

LIVERPOOL SOUTHERN HOSPITAL.—The Southern Hospital at Liverpool is chiefly a surgical hospital, and is intended principally for the reception of accidents from the neighbouring docks. It is built close to the river, and is open to the water, looking straight over to Birkenhead. The climate is described as cold, rainy, and foggy. The population of this part of the town is dense, though perhaps less so than that of the northern part. There are comparatively few women and children admitted, the number of beds allotted to them being only 28 (women 17, children 11) out of 106*; nor are there many medical cases in proportion to surgical*. There is no very strict separation between the medical and surgical beds; but the only wards that are specially reserved for medicine are one male ward of 11 beds and one female of 9. All infectious diseases and syphilis (both in male and female) are rigidly excluded, and it is directed that no chronic cases should be admitted, except for operation. Most of the admissions are "for urgency," without letters; but it is ordered that cases not very urgent shall bring letters of recommendation. The average number of beds occupied during the year 1862 was 77.

The hospital consists of two halves, separated by a corridor running the whole length of the house, and extending its whole height, out of which the wards open on either side. Thus they have no thorough ventilation; but, on the other hand, the corridor is lofty, and there is an arrangement by which all its windows can be opened at once, and kept open at the pleasure of the resident medical officer; so that the corridor is airy, and the want of exposure on both sides to the fresh air is the less felt in the wards. But it appears as if some deficiency had been experienced, since a system of artificial ventilation has been established, somewhat similar to the system 'par aspiration' found in many French hospitals†, in which the air (vitiated) is drawn out from the top of the ward by a shaft, in

* In three years the medical cases are stated to have been 911; surgical 1,744.

† This system is thus described by Dr. Wollaston, the Resident Medical Officer:—The south wards are warmed with hot air; the north wards, the female wards, and the children's ward by means of open fires, but hot air can be turned into these wards at pleasure. Cold air is admitted into all the wards through gratings in the floor, running by the side of similar gratings for the admission of the warm air; corresponding gratings in the ceiling conduct the vitiated air from the ward into a shaft over each ward, and all these shafts open into a chamber at the base of a tower on the roof. In this chamber fire is kept burning, thus expanding and driving off the decomposed air received from the wards, and producing a good circulation through all the rooms in the building. This is assisted, of course, by open doors and windows, weather permitting.

which it is heated, and thus the entrance of pure air from openings in the lower part of the ward, communicating with the atmosphere, is provided for. In one half of the hospital the air is warmed as it comes in, and the wards are heated in this manner; in the other they are warmed by coke fires.

It may be observed that the system of heating by open fires has been introduced into this half of the hospital, in place of that by heated air, which was previously in use. This would seem to argue that the system of heating by warm air had not been approved of; but we are not in a position to affirm that such was the case, nor, on inquiry of the resident and other medical officers, could we learn that any difference was noticed in the healthiness of the parts of the hospital thus differently heated.

As to the success of the treatment, it appears that for the three years before the hospital was altered as above (at which time it was also thoroughly drained and repaired, and put altogether into much better order) there were admitted in all 4277 patients, and 206 deaths occurred, a per-centage of 4·8. In the three years after the alterations the admissions were only 2655, and the deaths, 161 or 6·06 per cent. Yet the hospital is allowed to be in a much better state, and the cases (or at least the class of cases) are the same. This may show how worthless deductions must be, based on these general statistical propositions. The truth appears to be, that want of funds compelled the managers of the hospital to limit the number of patients, and therefore exclude the less severe cases.

Secondary affections appear to have prevailed before the alterations referred to, but are said to be rare at present; 13 cases of erysipelas and gangrene are known to have occurred in the hospital in the year 1862, of which two proved fatal. No distinct information on the subject of pyæmia is to be found in the hospital records, but this affection is represented as being not very common. The number of open wounds in the house is considerable, exceeding half the number of surgical patients, and that of grave operations is also considerable.

At the time of visit, out of 74 patients who were in the house 57 were surgical, and of these 37 were accidents, some of a very grave nature. There were 4 operations in the house of the classes selected; viz., 1 amputation of the thigh, 1 excision of the knee, 1 lithotomy, 1 strangulated hernia.*

In proof of the gravity of some of the accidents received at this hospital, we may notice that out of a total of 109 deaths among the surgical patients in 1862, 92 were from accident; viz.:

Burns and scalds	22
Fractured skull and spine	42
Compound fractures	10
Simple fractures	7
Various wounds and contusions	10
Gunshot wound	1—92

The following is the number and result of the operations for the six years 1857—62 *inclusive*:

	No.	Died.	
Amputations of thigh	16	4	1 of the fatal cases was at the hip-joint.
„ leg	17	6	Excluding cases separately returned as "Amputation of foot."
„ arm	15	3	This probably includes amputation of fore-arm, which are nowhere given separately.
	48	13	27·08 per cent. It must be remembered that most were primary amputations.
Strangulated hernia	10	4	
Lithotomy	4	1	

During this period the carotid, external iliac, and subclavian arteries have all been tied successfully.

The average stay in hospital of 20 cases of fractured leg was 37½ days, and of 20 cases of fractured thigh 54½ days.

J. S. B. T. H.

LIVERPOOL NORTHERN HOSPITAL.—The Northern Hospital at Liverpool, like the Southern, is an institution chiefly for the treatment of surgical accidents. The first of its laws provides that it shall be confined as much as possible to accidents and acute cases.

The building is as pure a specimen of a town hospital as can be produced, since it is purposely placed in the most busy part of this great city, close to the docks and other great works, from whence most of its patients may be expected to come. Its site is not

* We may perhaps notice that we saw here two cases of trephining of the skull, both apparently convalescent, and one of extirpation (said to be total) of the tongue, progressing at that time favourably.

the most eligible that could be imagined. It is situated within 50 yards of the river Mersey. There is an open space on the north side, used as a yard in connexion with a railway station, and on the west is the river; but a densely-populated town surrounds it everywhere else. The place is noisy, by reason of its close proximity to two large railway stations. It is annoyed by soda works at the back, which in some states of the wind are very oppressive; and there is a good deal of low fever aloug the river.

The male patients are mostly dock labourers and sailors; they are usually of drunken habits; and many of the female patients also are women who have met with accidents while drunk. Consequently neither the situation of the hospital nor the class of patients would lead us to expect such favourable results as at hospitals of the "rural" class.

The building itself is on the corridor plan. The wards are 15 in number, situated on the ground, first, and second floors. They are somewhat irregular in figure, and have recesses and corners which are unnecessary, and rather tend to obstruct ventilation. The windows also are neither so many nor so large as could be wished, and some of the smaller do not open. These defects proceed from an unfortunate aiming after architectural effect; but the wards, at least the surgical, seemed extremely sweet and well ventilated, which is accounted for by the windows being kept open constantly in the day, and sometimes at night also. Besides these, there are some openings for accessory ventilation, but no great value is attached to them; and, besides the fire-places, there is an apparatus for artificial heat, but it is not used. The cubic space per bed would be between 1000 and 1100 feet in most of the wards if all the beds were occupied. The distance between contiguous beds is on an average 32 inches, and between opposite beds about 7 feet. The water-closets open generally into the corridors, but some are in rooms, which also contain lavatories, and open out of the wards. The water supply is abundant, and all patients are, if possible, bathed on admission. The drainage is good, and runs directly into the river.

The hospital contains 130 beds, 85 surgical and 45 medical. 100 are for males; 30 for females. The average number of beds occupied in 1862 was 95. Admission is granted by letter daily and on emergency. All infectious diseases (including fever), syphilis, delirium tremens, mental diseases, and cases deemed incurable, are absolutely excluded; chronic cases are not excluded, but few apply, as the hospital is chiefly known as a place of refuge in case of accident. The surgical cases are chiefly accidents, of which the great majority are simple fractures. In the year 1862, out of 2671 admissions, 1718 were on account of accident, 548 on account of surgical diseases, and 405 were medical cases. The staff consists of 2 physicians and 4 surgeons. There are 17 nurses; 4 head nurses, 9 assistants, and 4 night nurses. All reside in the house, except 3 night nurses. The assistant nurses scrub the floors twice a week. The hospital should be whitewashed every year, but this seems not to be strictly attended to. The bedsteads are of iron, without curtains. The beds are not pulled to pieces, but are put out to air after a death.

In endeavouring to estimate the success of practice at this institution, the first thing that strikes us is that the death-rate is less than at some of the small country hospitals. Thus in the three years, 1860–62 inclusive, 8848 patients were admitted. The deaths are stated at 311; but deducting 19 who were brought in dead in the two latter years this becomes 292, or 3·4 per cent.; and even this may be too high, inasmuch as the fact is not noticed in the report for 1860, though probably some are counted who were dead before admission. If this death-rate is compared with those of many country infirmaries of similar size*, which admit little but chronic disease, the reader will see at once that a country or town situation is not the chief cause of variation in the death-rate. No doubt the reason why this hospital has few deaths is that fevers are excluded from the medical side, that medical patients are few, and that a very large proportion of the surgical cases are simple fractures.

Secondary diseases are not very common. Erysipelas, however, is sometimes prevalent, and is occasionally severe. Phagedæna and hospital gangrene have not been known of late years, and pyæmia is very rare.

With respect to the frequency and results of surgical operations, we have only been able to obtain the list for the years 1861 and 1862. It is as follows:—

	No.	Deaths.	
Amputation of the thigh, for injury	7	4	
" leg "	10	3	
" arm "	4	2†	
" " after excision of the elbow	1	1	
" forearm, for injury	1	—	
Excision of elbow	2	1	followed by amputation.
Herniotomy	4	1	
Lithotomy, child	1	—	
" adult	1	—	

At the time of our visit the house contained 98 patients, which is about the average number. Of these 29 were medical, including 13 cases of acute or grave diseases. Of the 69 surgical cases, 50 were accidents, including 2 burns, 5 compound fractures, and 24 simple fractures; 8 were acute cases, including 2 amputations of the leg, 1 double

* *e.g.* Canterbury.

† One of the fatal cases was at the shoulder joint.

amputation of thigh and arm, 2 cases of erysipelas, and one of diffuse cellular inflammation originating in the hospital; 11 were chronic or trivial cases. There were 34 cases of open wound or sore. J. S. B. T. H.

LIVERPOOL ROYAL INFIRMARY.—The Royal Infirmary at Liverpool is an old building, which has undergone various alterations, and others are still in progress. It is situated on a high level in the centre of the town of Liverpool, has good drainage and water supply, and stands in a tolerably large area of ground, which is used for patients' exercise. The plan of the building shows that the greater part of it is arranged around three sides of a square court, and has a corridor running round the inside, so that the wards are ventilated on one side only. Besides the natural ventilation, there are ventilating holes in the ceilings and walls, and in some of the wards near the floors also, communicating with the external air. There was an artificial system of ventilation, connected with a tower standing in the court; but this was found useless, and has been given up, and the shaft made into a clock tower.

Notwithstanding the absence of through ventilation, the wards were quite free from any unpleasant odour on two occasions when we visited the infirmary, the windows being kept open during the day, and some also usually at night.

Patients are admitted as usual by letter and on urgency; but admission is given every day except Sunday. We have no account of the number of medical patients admitted, with and without letters; but accidents are numerous and severe, numbering 395, out of 1380 surgical cases admitted in the year 1862. Children under seven years are only taken in on urgency. The total number of beds is 230, of which 93 are medical and 137 surgical. The medical and surgical wards are separate. In 1862 there were admitted into the 93 medical beds 1093 patients (roughly speaking 11 patients per bed), and 106 deaths occurred (or rather more than one per bed), while into the 137 surgical beds 1380 patients (or 10 per bed) were admitted, and 68 deaths (rather less than ½ per bed) occurred. The death rate on the whole number admitted was 7·6 per cent.

The surgical cases appear to be relatively more acute than the medical. From the latter all fevers and infectious diseases are rigidly excluded, except that a few are taken in accidentally; but the chronic and visceral diseases developed in sailors and others by residence in hot climates form a large proportion of the admissions. In judging of the results of treatment it must not be forgotten that a large number of the patients (especially those suffering from accident) are sailors and prostitutes; many of them persons of intemperate habits and broken constitutions.

Operations are frequent here. The following is the list of those in the classes selected for comparison during the three years 1860–62 inclusive:

		No.	Died.
Amputation of the thigh,	for injury	9	6
" "	for disease	17*	8
" leg,	for injury	7†	4
" "	for disease	18	1
" arm,	for injury	7‡	—
" "	for disease	1§	—
" forearm,	for injury	3	1
" "	for disease	1	—
Excision of the shoulder		2	1
" elbow		13	1
" wrist		1	—
" knee		4	—
Herniotomy		4	3
Lithotomy, in children		11	—
" adults		2	1

Secondary surgical affections appear to be about as prevalent here as in well managed London hospitals, and from similar causes. Erysipelas and diffuse inflammation originate occasionally in the surgical wards, but are more frequently taken in from the town. They do not spread in the wards, as far as we learnt. There is now a separate ward for cases of erysipelas, in which, at the time of our last visit, there were three cases, one of which had originated in the hospital.

Out of 150 deaths occurring in 1862 we find pyæmia named in 10 cases (in one of which it is stated to have been primary or spontaneous), and erysipelas in five, one being idiopathic. It is worth remarking, that most of these cases of both diseases occurred near together. However, in this list 20 deaths are referred to operations and acute surgical affections, and 18 to the effect of accident; and it is quite possible that out of this number some who were not examined after death may have really died of pyæmia. Of the medical cases no less than 35 were due to phthisis, and most of the remainder were the result of chronic visceral disease. Few deaths appear to have resulted from acute medical causes.

The average number of patients in the house was, in 1862, 189. At both times of our visit the numbers were below the average, and gave hardly a fair idea of the usual state

* One at the hip joint; cured.
† One of the fatal cases was a double amputation.
‡ One at the shoulder joint.
§ At the shoulder joint.

of the hospital. This was caused by alterations in the building, which have been in progress for some time. The alterations consist in raising a building in the courtyard, which used to consist of one story only, to two stories, which are to be devoted to a male and female accident ward on the ground floor, and wards for diseases of women, and for operations on the uterine organs, on the upper floor. The latter are intended to be especially spacious, well ventilated, and well constructed, so that cases of ovariotomy may be safely treated in them, which at present is hardly the case in the ordinary wards of the hospital.

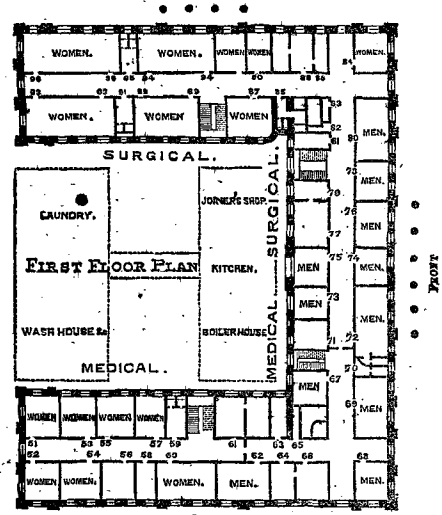
At our first visit we found only 136 patients in the house, of whom 106 were surgical, 34 admitted on account of accident, 40 classed as acute cases, and 32 as chronic. There were 13 cases of the operations selected; viz., 2 amputations at the shoulder joint, 3 amputations of the thigh, 2 of the leg, 3 cases of excision of the elbow and 1 of the knee, 1 of lithotomy, and 1 of strangulated hernia. There were 8 cases of diffuse inflammation, not originating in the hospital, 1 case of erysipelas, and 1 of pyæmia originating in the house.

At our next visit the number of cases was somewhat higher, 160; but the nature of them was much the same.

The proportion of compound to simple fractures seems high. A large number of the medical cases are of a chronic nature, but acute rheumatism is common.

J. S. B. T. H.

MANCHESTER ROYAL INFIRMARY.—This, the only general hospital of any importance for the whole of Manchester, occupies a noble site in the very centre of the town. It stands alone, on grounds of moderate but sufficient dimensions, in the centre of a large square. The building forms three sides of a rectangle. The ground floor is



devoted to private rooms, offices, and so on. The first and second floors are occupied exclusively by patients. The hospital is constructed essentially on the corridor plan. Thus, on each floor, both in the centre building and in each of the two wings, a central corridor runs in a straight line from end to end, so that in the angles the corridors cross one another, and the wards are arranged symmetrically on either side. The corridors are spacious and well ventilated, and have from their peculiar formation a window at each end. Besides this they have free communication with the wards, and have four staircases leading from them. The corridors on the upper floor have ventilators in the roof. The wards are small, but vary a good deal in size; and allow, in those devoted to medicine, a cubic space to each bed of about 1000 feet; and in those devoted to surgery

a cubic space of between 1300 and 1800 feet. The majority contain from four to six beds apiece. A few hold 3; and 3 or 4 of the largest wards hold from 7 to 10. It should be observed, however, that occasionally two or even three contiguous small wards have had the upper part of the party-wall, to a depth of about two feet, removed, so that in some respects they may be considered to form a single ward; and, again, that in many instances small windows which do not allow of being closed have been pierced in the upper part of the walls separating adjoining wards. Ventilation is effected partly by the means just enumerated; but there are, to the same end, free communications with the corridors by openings in the upper part of the walls, ventilators in the ceilings of the upper wards, and lastly, but most importantly, ordinary sash-windows placed on one side of each ward, and furnished at the upper part with a perforated zinc plate extending all across the window to a depth of about four inches. The ventilation of the wards seemed to us exceedingly good; the only wards in which there were any appreciable defects were those situated under the porticoes; these were acknowledged to be somewhat stuffy, and seemed so to us. There are open fire-places in all the wards, and the hospital is lighted by gas. The ceilings of nearly all the wards on the upper floor are arched, but the ceilings of the wards on the lower floor are flat. Both walls and ceilings (of wards and corridors) are painted, and the floors are oiled, but also scrubbed. The hospital is cleansed thoroughly once a year. The water-closets are well drained, ventilated, and altogether unobjectionable. They communicate with the corridors, and not with the wards, and are well separated even from the former.

The hospital has been in its present condition for three years only; prior to that time the corridors were much more confined and close; the wards too were without any means of ventilation beyond that supplied by the open fire-places, the doors, and the ordinary sash-windows; the walls were whitewashed, and the floors scrubbed in the usual way, and the water-closets communicated with the wards. The prevalence of hospital diseases up to that time, and especially just before it, led to the changes which have been made.

The bedsteads are of iron, the mattrasses of flock and of horse-hair, and are (especially after bad cases) frequently purified.

The nurses have board and lodging in the house. There are six head nurses and six night nurses, with 18 assistant nurses. It is considered that there is one head nurse to 40 or 50 patients, and an under nurse to 12 or 16.

There are six physicians and six surgeons to attend to the in-patients; and resident there are, a medical officer, a house surgeon, a junior house surgeon, and three physicians' assistants.

All kinds of diseases are freely admitted into the hospital, excepting in the case of women advanced in pregnancy, and excepting itch and incurable diseases. Syphilitic patients too are rarely admitted. The medical cases (exclusive of fever cases) are said to be mostly chronic, but the surgical comprise a very large number of serious accidents. Surgical and medical cases are put into separate wards, and a special portion of the hospital is set apart for fever, small-pox, and other infectious disorders. A vehicle is kept at the hospital for the conveyance of persons suffering from the latter class of diseases. The patients are chiefly the labourers in the different manufactories of the neighbourhood; and more than one half of the total number admitted come from Manchester and Salford. As regards treatment, it may be mentioned that depletion has fallen into disuse, and that stimulants are largely employed.

The hospital contains 53 wards and 260 beds; of these, 21 wards (comprising 102 beds) are devoted to the reception of medical patients, and 32 wards (comprising 158 beds) are set apart for surgical cases. 152 of the beds are for males, 108 for females. Of the medical wards 8, including 29 beds, are for fever patients.

At the time of our visit the hospital contained 218 patients (122 males and 96 females); the 29 fever beds contained 19 fever cases, of which 11 were cases of typhus, 2 were cases of typhoid, and one was a case of scarlet fever. The 73 general medical beds contained 61 medical cases, which were almost all of a chronic nature, the exceptions being two cases of erysipelas, two of acute rheumatism, one of pleurisy, one of pneumonia, and one of acute dysentery. The chronic cases, however, included cases of heart disease, albuminuria and phthisis. There were 138 surgical patients, of whom 57 were suffering from the effects of injuries, 28 were acute cases, and 53 were chronic. The cases comprised 59 with open wounds, 3 burns, 28 simple fractures, and 15 compound fractures. Of operations of the selected class, there were the following: a case of primary amputation of the thigh, and 1 of amputation of the thigh for disease, 2 cases of primary amputation of the leg and 1 of the arm, an excision of the elbow, a case of herniotomy, and a case of lithotomy,—total 8. There were also in the wards a case of erysipelas, and 1 of diffuse inflammation (both admitted for the diseases specified), and 2 cases of traumatic gangrene, both of which had originated in the hospital.

On examining the statistics of the hospital, we find that from its foundation in 1752 up to the 24th June 1863, 130,806 patients had been received into it, of whom 9,838 had died, giving a mortality of 7·5 per cent. From the 24th of June 1855 infectious cases have been admitted into a separate department, and we find that out of 1,577 patients thus admitted 236 have died, or 15·1 per cent. The year ending 24th June 1863 was doubtless a heavy one; and we observe that in that year 1,905 patients were admitted, and 261, or 13·6 per cent., died. Out of the total number admitted, 189 were placed in the fever wards; of these, 26, or 13·7 per cent., died. But in considering this mortality it is important to bear in mind a fact stated in the report, that of the total number of patients whose deaths are registered, 12 were brought to the hospital dead, 24 died immediately after admission, and 47 within 24 hours. We quote this statement chiefly as an illustra-

MANCHESTER.

tion of the influences which constantly tend to raise the mortality of town hospitals, and especially of those occupying central conveniently situated localities.

Medical cases are admitted in smaller proportion than surgical cases. Thus (but there are some discrepancies, probably unimportant, in the statistics,) in the year which we have selected, 610 medical cases (including 189 fever cases) were admitted into the hospital, and 1,269 surgical cases (including 674 cases of accident). The relative mortality of medical and surgical cases it would be somewhat difficult now to estimate, and information on this head is not given in the report. Of the patients admitted into the medical wards, (including those suffering from febrile disorders), 25 were suffering from typhus, 39 from typhoid, and 24 from "fever," 22 were suffering from scarlet fever, and 68 from small-pox. As regards other medical cases, little need be said beyond the fact that they included such a variety of cases as one might expect to find in a town hospital, and a fair proportion of cases serious and likely to end fatally. Of the surgical patients, a few were suffering from such diseases as primary syphilis, skin diseases, and eye affections; but there were among them 33 cases of strangulated hernia, 9 of stone in the bladder, 10 cases of stabbing, 4 of cut throat, 48 of burns and scalds, 6 of wounds of arteries, 3 of gun-shot wounds, 30 of fracture of the skull, 9 of fracture of the jaw, 38 of compound fracture of the upper extremity and 66 of the lower extremity, besides a very large number of simple fractures, of lacerations, and of serious cases of other kinds. We examined the records of death for six months of this year (1863), and found that they corresponded pretty accurately with what might have been supposed from the nature of the admissions. Thus, on the medical side we found that the deaths included 6 from typhoid fever, 4 from typhus, and 4 from small-pox; and on the surgical side we found the deaths to comprise, 8 from fracture of the skull, 18 from compound fractures, 8 from severe smashes, 14 from burns and scalds, 6 from severe laceration, and 6 from strangulated hernia.

Operations, especially amputations, have, as might be supposed, to be very frequently performed; and although we are unable to give the statistics, we are informed that erysipelas and pyæmia are very common, and that these diseases were especially common about three years, or rather more since. 40 cases of lithotomy were performed in 10 years on children under seven years, with three deaths.

There is no evidence that ordinary medical cases do badly in the hospital; it is certain, however, that fever spreads from the fever wards; recently, for example, a surgical patient caught small-pox from a patient in an adjoining fever ward. There was a communication (for ventilation) between the wards, which has been since closed. Lately, too, three nurses and one of the physicians have caught typhus, and the resident medical officer had, at the time of our visit, just died from the same disease, contracted in the discharge of his duties.

The Manchester Infirmary has, as is fully acknowledged by those who are connected with it, many faults of construction; it is a combination of long corridors with small wards on both sides. When the hospital was rebuilt in 1847 an elaborate system of artificial ventilation was adopted, but its use was speedily abandoned. Since that period natural ventilation only has been employed; but numerous and important improvements, some of which have been mentioned, have been from time to time introduced, especially about three years ago, and it is stated sanitary benefit has resulted. But in considering the alleged unhealthiness of the hospital it must not be forgotten that the Manchester Infirmary is a large surgical hospital, small in proportion to the wants of the town, and that it receives a very large number of serious accidents, and has performed in it a large number of grave operations.

J. S. B. T. H.

NEWCASTLE.

NEWCASTLE INFIRMARY.—The infirmary is within the town, close to the railway station, upon a hill, and commanding a wide prospect. It possesses a large garden, which is used as an airing ground.

The hospital has, in addition to the basement (which contains the out-patient department), three floors. Its construction is extremely irregular, doubtless chiefly in consequence of having had successive additions made to it at various times. The older portion of the hospital may be roughly described as having the form of the letter L; and is built on the corridor plan; a long corridor occupying one side of each of the arms, excepting in one point, where wards have been constructed on both sides. The newer portion of the hospital consists of three floors of wards. The wards are six in number, and are placed in pairs, side by side. Each of them measures 111 feet long, 24 feet wide, and about 14 feet 6 inches high, and contains 24 or 25 beds. The walls are coated with parian cement, and have a dull slate colour. The ceilings have numerous deep transverse beams. There are many windows on the outer side of each ward, and two at each end. The windows open in three pieces, which revolve horizontally on their axis. There are also, besides two doors, several open windows in the wall separating the wards. In order to aid in ventilation, there are several tables along the centre of each ward, which are fixtures, and of which the legs are so constructed as to admit air from without; and for the purpose of removing foul air, there is between the fire-places (which are dos-à-dos in the party-wall) an iron box communicating above with a flue, which passes up to the roof, and in its progress has an opening of communication with the upper part of the ward. About 1600 cubic feet are allowed to each bed. There are a bath-room and scullery to each pair of wards, these being placed symmetrically on opposite sides of the extremity of the building. The closets are separated from the wards by a lobby.

The other wards, which are eight in number, are scattered about in various parts of the old house; three (with four beds each) being on the ground floor; three (with four,

nine, and 17 beds respectively), on the first floor; and two (with five and 22 beds respectively) on the second floor. All of these, excepting one, have windows on one side only, the other side abutting on the corridor; but they have in some instances perforations in the wall, by which a communication is established with the corridor. The largest of these wards are long and narrow, and scarcely one of them can be regarded as very suitable for the reception of patients. A surgical ward on the first floor, however, with nine beds, and with a window at one end as well as windows at the side, is considered the most cheerful, if not the healthiest ward in the hospital. The walls of the older wards are coloured part way up, and above that whitewashed. The water-closets are away from the wards.

The floor of the accident ward is oiled and waxed, but not so the floors of the other wards. All, including this, are scrubbed once or twice a week. The fire-places are all open, and the wards are lighted by gas. The ventilation of the new wards seemed very good; but the older wards were without exception stuffy, and in one or two instances even worse than that term implies. The drainage of the premises is good, and the closets quite unobjectionable. Besides the baths in the building itself, there is in the grounds of the hospital (where it has stood for six or seven years) a Turkish bath. Patients are, by rule, bathed on admission. The bedsteads are of iron. In the accident wards the mattresses are filled with chaff, but those of other wards with hair or straw. These are emptied out and thoroughly cleansed after deaths and certain forms of disease.

A head nurse by day and a nurse by night take the charge of each flat, and there is a nurse to each Lock ward. Each flat has also two or three assistant nurses. All live in the building. There are four physicians, four surgeons, a house surgeon, an assistant house surgeon, and a fair number of pupils who give assistance in the wards.

There is a good deal of cupping and leeching, but very little venæsection. Mercury is freely used both in venereal and pulmonary affections. But the treatment adopted is chiefly stimulating and tonic. Wounds are cleansed with tow, which is thrown away, and are dressed with water dressings; sometimes poultices are used, but rarely ointments.

Accidents and urgent cases are admitted on application; other cases require governors' letters, and are received on Thursdays. All infectious diseases are excluded, also women advanced in pregnancy, maniacs, and tedious or incurable cases. Children are objected to, but often admitted. Primary syphilis is taken into special wards. Patients come chiefly from Newcastle and its neighbourhood, but many come from the adjoining counties. They consist chiefly of sailors, mechanics, pitmen, agricultural labourers, and some domestic servants. The medical and surgical and syphilitic patients are separated from one another.

The hospital contains 215 beds*; 141 male and 74 female; 76 medical and 139 surgical. Of the surgical, 40 (18 male and 22 female) are for syphilitic patients. At the time of visit there were in the house 160 patients, of whom 132 were males, 48 females; of whom 65 were suffering from medical complaints, 92 from surgical complaints, and 38 from venereal affections. Of the medical cases 4 were acute; the remainder were chronic, but 31 were cases of chronic affections dangerous to life. The cases included 2 of acute rheumatism, and 1 of perityphlitis, 4 of chronic heart disease, 4 of Bright's disease, and 12 of phthisis. The surgical cases comprised 28 acute diseases, 25 accident cases, and 62 chronic (including 23 venereal cases). There were 50 open sores, 7 simple fractures, 7 compound fractures, 3 burns, and 2 cases of erysipelas, originating in the hospital. Of the classes of operations selected for comparison, there were 4 amputations; 1 primary at the shoulder joint, 1 primary of the fore arm, 1 primary of the leg, and 1 of the leg for disease; there was also a case of lithotomy.

In the year ending the 31st of March 1863 the daily average number of in-patients was 178. 1566 patients were admitted into the house, of whom 514 were medical, and 1052 surgical (comprising 310 cases of accident and 309 syphilitics). Among the accidents were 26 burns and scalds, 10 concussions of the brain or spine, 8 fractures of the skull, and 151 of other bones. As to operations, there were 24 amputations; 12 for accident, of which 4 died; and 12 for disease, of which 3 died. Pyæmia caused death in 2 cases. Lithotomy was performed 3 times with success. In the previous year the total number of admissions was 1512; in the year before that 1720; but in each case the relative proportions of the various classes of disease admitted were pretty nearly the same. In 1861-62, 25 amputations were performed; 14 were rendered necessary by accidents, and of these 9 died; and 11 were performed for disease, and of these 1 only died. There were 11 cases of lithotomy, with 1 death; and 4 of herniotomy, with 1 death. In 1860-61, there were 37 amputations; 23 were for accident, of which 13 died; 3 were double amputations for accident, of which 2 died; and 14 were for disease, of which 4 died. Several of these seem to have died of pyæmia. There were 5 successful cases of lithotomy and 6 cases of hernia, of which 3 were fatal.

The records of the hospital are most imperfectly kept, so that it is impossible to ascertain, with any degree of accuracy, the diseases for which patients were admitted, and still less the causes of death. A kind of statement is made in the annual report; but the deaths of in and of out-patients are mixed up together in it, so that the actual number of deaths occuring annually in the hospital is unrecorded, and the per-centage of deaths not to be ascertained. Again, an operation table is published, but the operations are grouped in such a way as to furnish information of comparatively little value. One

* Two other wards, with 14 beds between them, can be used, but were at the time of visit dismantled.

fact, however, certainly appears, and that is, that amputations (which are pretty numerous) are unusually fatal; and that pyæmia has certainly been a prevalent complication, though less so the last year or two than previously. A little erysipelas is said to occur at times, but rarely to prove fatal; and phagedæna is stated to occur only in the syphilitic wards. The medical cases received into the hospital are mostly chronic.

The hospital, though in the town, is excellently situated. Its construction, however, is extremely faulty, and the greater part of the old building appears to be unused, and simply an incumbrance. The wards, even the new ones, are sombre looking. Again, the wards seem badly supervised, the ventilation, which ought to be (in the new wards particularly) excellent, is impeded; and patients smoke and commit other irregularities in them.

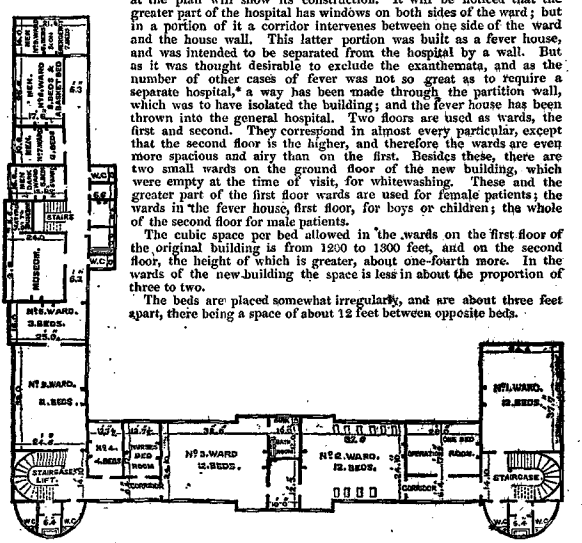
J. S. B. T. H.

SHEFFIELD.

SHEFFIELD.—The town of Sheffield is a great manufacturing place, rapidly increasing in population and business. It has many elements of healthfulness, however, being situated in a beautiful and well watered country, and being well drained and dry. The inhabitants are prosperous, and it is said live well, but are not dissipated. There are numerous offensive manufactories, but none in the neighbourhood of the hospital, which stands on the outskirts of the town (having been outside of it a short time ago), in a field of two acres, used for the patients' exercise. It is on rising ground, with a beautiful prospect from the windows. The shape of the building is that of the letter L. A glance at the plan will show its construction. It will be noticed that the greater part of the hospital has windows on both sides of the ward; but in a portion of it a corridor intervenes between one side of the ward and the house wall. This latter portion was built as a fever house, and was intended to be separated from the hospital by a wall. But as it was thought desirable to exclude the exanthemata, and as the number of other cases of fever was not so great as to require a separate hospital,* a way has been made through the partition wall, which was to have isolated the building; and the fever house has been thrown into the general hospital. Two floors are used as wards, the first and second. They correspond in almost every particular, except that the second floor is the higher, and therefore the wards are even more spacious and airy than on the first. Besides these, there are two small wards on the ground floor of the new building, which were empty at the time of visit, for whitewashing. These and the greater part of the first floor wards are used for female patients; the wards in the fever house, first floor, for boys or children; the whole of the second floor for male patients.

The cubic space per bed allowed in the wards on the first floor of the original building is from 1200 to 1300 feet, and on the second floor, the height of which is greater, about one-fourth more. In the wards of the new building the space is less in about the proportion of three to two.

The beds are placed somewhat irregularly, and are about three feet apart, there being a space of about 12 feet between opposite beds.



SHEFFIELD INFIRMARY.—Attic Floor.

This appears an excellent plan for the construction of a hospital of this sort. Possibly an accident ward on the ground floor might be a useful addition, since at present there are no male wards for adults, except on the second floor, and no lift, except for coals and diets, so that cases of accident have to be carried up to the second floor on stretchers.

The hospital contains 152 beds; no very great supply for so large a town as Sheffield, with a population of about 185,000, and the extensive country supplied by the hospital,

* Fever is rare in Sheffield, and generally occurs sporadically. Phthisis, pneumonia, and rheumatism, grinders' asthma, and lead palsy are among the chief diseases, with occasional epidemics of scarlatina, measles, and (this year small-pox.

the radius of which is calculated at about 20 miles. The beds are allotted in this proportion,—male medical (adults) 18, female medical (adults) 16, boys' wards (almost exclusively surgical) 19. All the rest of the wards are surgical, though it is found necessary to admit medical cases into them. One ward of three beds is set apart for burns (children), and one of five beds for eye cases. Thus it is seen that the hospital is chiefly surgical. At the time of visit the two ground floor wards were being whitewashed; in the rest of the hospital, containing 140 beds, there were 132 patients, of whom 43 were medical. The great majority of the medical cases were chronic, but about 12 might be set down as acute diseases. The 89 surgical cases comprised 24 of accident; and the gravity of the cases of accident received here is shown by the fact that besides ten simple fractures there were seven compound fractures and two cases of burns or scalds.* Of the remaining surgical patients 26 were classed as acute, including one amputation of the thigh and one of the leg, and the following secondary surgical complications:—one case of erysipelas and one of pyæmia coming on in the hospital, two of diffuse inflammation, and one of phagedæna, admitted from outside. The remaining 39 cases are classed as chronic.

The deaths for a year, June 1861–1862, were 92, out of a total of 959 (375 medical, 584 surgical) or 9·6 per cent. They may be classed thus:—

Visceral diseases	35 (Phthisis 24).
Acute medical affection	17
Cancer	3
Acute surgical disease and operation	16 (including 10 cases of pyæmia, 8 with and 2 without operation).
Accident	18
Chronic complaints	3
	92

With respect to the prevalence of secondary affections, it appears that in spite of the good construction, excellent situation, and careful management of this hospital, the grave nature of the cases and the full condition of the wards render it about as liable to erysipelas, pyæmia, &c. as our metropolitan hospitals are. The large proportion of cases of pyæmia in the list of deaths will be seen. The following figures, which comprise the list of operations of the selected classes, for the year 1862, will show that pyæmia bears an equally large proportion to cases of operation.

	Total No.	Cured.	Died.
Amputations of thigh	11	7 (2 died of phthisis out of the house, stumps being healed, 1 five months and 1 four months after operation.)	4 (2 of pyæmia. 1 of pneumonia and empyema. 1 from shock.)
Amputations of leg	10	7	3 (All of pyæmia.)
Amputations of arm	8	7	1 (Of pyæmia.)
Lithotomy	6	5	1 (Of uræmia (seven days after operation).)
Herniotomy	2	1	1 (Of shock. (12 hours.) Admitted when strangulation had existed two days.)

Hospital gangrene, however, has not been seen for many years. When erysipelas breaks out the cases are isolated, if possible. The disease has not been noticed to spread in the house, nor have any other diseases, except scarlet fever on one occasion, and the health of the residents is good, and the hospital is, apparently with reason, regarded as a healthy dwelling-place.

T. H.

* It should be mentioned that the visit was made in the middle of summer (June 13th). Burns are very common here.

No. 15. *The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.*

ENGLISH RURAL HOSPITALS.

ENGLISH RURAL HOSPITALS.

BARNSTAPLE.

BARNSTAPLE INFIRMARY (NORTH DEVON) is very pleasantly situated near the river Tor, and commands an extensive view; the climate is mild, but very rainy; and it is thought that wounds are rendered sluggish in healing by the constant damp and warmth, since when frost sets in they seem to improve. Rheumatism appears a very common affection, and rheumatic fever furnishes the bulk of the acute cases which the hospital receives. Otherwise the medical cases are chiefly chronic; as are also the surgical, with the exception of accidents. But acute diseases do not seem to be very prevalent in the neighbourhood, phthisis and visceral diseases appearing to comprise the bulk of all affections. Operations of the class selected are rare here, and as no record is kept of them we have no definite information to give on the question of their success.* Secondary hospital affections are rare, as the class of cases admitted would prepare us to expect; but erysipelas occurs in scattered instances in the house (one case was in the wards at the time of visit), and one or two cases of pyæmia have been seen. Hospital gangrene is unknown. Erysipelas has been known on one occasion to spread in one of the wards.

The number of admissions given in the report during three years was 1667, but from this a deduction ought to be made for re-admissions, since here, as in so many other hospitals, if a patient has been in the house more than a certain time (two months in this instance) his name is re-entered, so that he counts in the summary of the register as two patients. The deduction on this account would not exceed one twelfth. The number of deaths was 37, which, after allowing for the above deduction, would be considerably under 3 per cent. These are classed as—

Visceral disease - -	11	
Acute medical cases -	5	
Cancer - - -	1	
Acute surgical cases -	9	(including 3 cases of strangulated hernia).
Chronic surgical cases -	2	
Accident - -	9	(complicated in 2 cases with delirium tremens).

As to the construction of the hospital, it dates about 40 years back, and consists of two halves, for males and females, having each its separate staircase, and separate in every respect. There is a larger and a smaller ward on each of the three stories, except on the ground floor, where there is only one ward, that on the male side, the rest of the space being occupied by the necessary dwelling rooms and offices. The present hospital contains 14 beds; but a new wing is in the course of construction, and is very nearly finished, which will contain three wards, one on each story, of which that on the ground floor is to be for the present used as the chapel. Each will contain 10 beds. The wards appeared comfortable and airy, although none of them (except one small chamber for two beds) contained as much as 1000 cubic feet of air per bed, the average over the whole building being only 771 cubic feet. In the new building it will be larger; nearly 1000 cubic feet per bed. There is a system of accessory ventilation in use in the old hospital, consisting simply of holes pierced in the walls of the hospital, and communicating, by means of pipes under the floors, with openings in the floor of each ward. The only force by which the air would seem to pass into the ward is the difference of specific gravity between the air in the ward and that of the external air. This simple plan, however, appears always to admit a considerable volume of air into the wards. There are openings in the upper part of the walls for the exit of foul air. The plan has answered to the satisfaction of the hospital authorities, and is to be adopted in the new part of the hospital, with the addition of a shaft communicating with the exit holes for air, and in which the air can be warmed, and so sucked out of the wards. Doubtless in wards where the cubic space is small such ventilation, if not necessary, is very useful.

With reference to the state of the hospital at the time of visit, it contained 50 patients equally divided between medical and surgical. Of the medical 3 might be reckoned as acute cases, and 2 among the surgical. Of the remainder, 7 were accidents, including 1 simple and 1 compound fracture, and 16 were chronic cases. There was 1 case of erysipelas originating in the house. There were no grave operations in the house; and there had been only one (viz., for strangulated hernia,) in four months. T. H.

BATH UNITED.

BATH UNITED HOSPITAL.—The hospital is in a crowded neighbourhood in the centre of the town, and lies low, a few feet only above the level of the river. The front of the hospital is in a line with other houses in the street in which it stands, and the only airing ground is a small garden, between the new hospital in front and an old block of buildings behind.

In general form the hospital resembles the letter T; the transverse bar at the top representing the new building, the perpendicular line, with its foot, indicating the position of the old building and of some connecting wards between them.

The new building has three floors, of which the first and second are exclusively devoted to wards. On each floor there is a transverse corridor, running from one end of the hospital to the other, and having wards nearly symmetrically placed in back and in front. The staircase is to the back of the corridors in the central part of the hospital, and faces the entrance hall. Corridors and staircase are perfectly well ventilated. The water-closets on each floor are placed at one end of the building, in connexion with the corridor, from which they are separated by a lobby. They are well ventilated, well constructed, and satisfactory. There are moveable baths on each floor, and in the base-

* No deaths occurred after lithotomy in three years, nor any in which amputation is noticed, but amputation may have preceded death in some of the cases classed as deaths from accidents.

ment, a bath-room to which the mineral waters are laid on. There are nine wards in this house, five on the first floor and four on the second. They vary considerably in size, and contain from twelve to three beds each. They are of fair height, and are ventilated by sash windows of sufficient size, each of which has a perforated zinc plate in place of one of the upper panes. For the most part the windows are placed necessarily on one side only of the wards, but in the wards, occupying the corners of the building, there are windows in two contiguous sides. There are also in each ward several apertures between the floor and the skirting board, which admit fresh air from without, and one or two openings communicating with the corridor. The wards are heated by open fireplaces and lighted by gas.

The old building* was originally a private house. It presents a central staircase, from the back† of which (on each floor) the water-closet projects. The wards (of which the chief are on the first and second floors) are placed around this staircase on three sides, but are somewhat differently arranged on each floor. They are rather low; two of them extend from the back to the front of the house, and have abundance of windows at each extremity; two others, different from one another in size and shape, are situated to the front of the house, and have windows on one side only. As regards the character of the windows, fireplaces, gas illumination, and baths, the wards of this house resemble those of the new building, but they are without ventilators communicating either with lobbies or with the outer air.

It should be added, that there are two or three wards on the ground floor, of which some are in a kind of building connecting the two hospitals. They are rarely used, however, and then only under great pressure, and are not (indeed are not considered to be) at all suitable for the reception of patients.

The corridors and lobbies in both buildings are heated by hot-air flues. The water supply is abundant. Patients, as a rule, are bathed on admission. The hospital is thoroughly cleansed once annually, and the wards are scrubbed twice a week. The walls are coloured. At the time of our visit the hospital was perfectly clean, but the windows were closed, and the wards were consequently not so fresh as they might be. The bedsteads are of iron and without curtains. Horsehair mattresses are used for special cases, but flock beds are those in common use. They are thoroughly cleansed or destroyed after offensive cases. The wards appeared to us to be rather crowded with beds.

The staff of nurses embraces a superintendent nurse, twelve nurses and four assistants, together with six probationers, who receive instruction with the object of becoming private nurses. They all live in the house. The nurses perform night duties in rotation. The assistant nurses act as scrubbers.

There are three physicians and three surgeons, of whom one of each attends daily. There are also a resident medical officer, a house surgeon, and a dispenser. Little, if any, bleeding or depletion is had recourse to. Wine and brandy are given in moderation. Water dressing is mostly used in the treatment of wounds; ointments rarely. Sponges are generally used for the purpose of cleansing wounds.

The majority of patients are admitted by letter, but accidents and urgent cases need no form of recommendation. There is a daily admission. Applicants come from Bath and from within a circle of 20 miles radius; they consist chiefly of labourers. Servants of subscribers are admitted into two special wards. Cases of lunacy and of primary venereal disease are excluded, but every other class of disease is freely admitted. Medical and surgical cases are separated, except in the special wards for servants. Infectious diseases are ordinarily received into the general medical wards. Cases attacked with erysipelas in the surgical wards are separated.

When all the wards are furnished the hospital makes up 116 beds; but ordinarily the number in use is 99, of which 75 are contained in the new hospital. Of the 99 beds, 58 are for males, including 13 boys, 41 for females; 47 are for medical cases, 46 for surgical, and 6 for either medical or surgical cases.

At the time of our visit the hospital contained 80 patients, of whom 48 were males, 32 females; and of whom 42 were medical and 38 surgical. Of the medical cases, 13 were acute, 17 were chronic, and more or less dangerous to life, and 12 were trivial. Among the more serious were 2 cases of acute rheumatism (convalescent), 2 of pneumonia (convalescent) 1 of typhoid, 1 of scarlet fever, 1 of scarlatinal dropsy, 1 of erysipelas of the face, 1 of empyema, and 1 of pericarditis. Of the surgical cases, 7 were acute, 15 were cases of accident, and 16 of chronic affections. These cases included 15 in which there were open sores, 8 of simple fracture, 2 of compound fracture (in one of which there had been sloughing), 1 of erysipelas of the face, and 1 operation of the classes selected for comparison, viz., an excision of the knee.

In the year 1862, 1055 cases were treated to a conclusion, of which 83 (or 7·9 per cent.) died. 537 cases and 50 deaths were medical, and 518 cases and 33 deaths were surgical, and the respective death-rates were 9·3 and 6·4 per cent. In 1860 the total death-rate was 6·1; that for medical cases 9·0, and that for surgical 3·1. In 1859 the total death-rate was 6·8; that for medical cases 8·8, and that for surgical 5·5. The average daily number of beds occupied in 1862 was 79. Among the diseases treated to a termination in that year we find 35 of fever, with 6 deaths; 1 of variola; 77 of phthisis, with 9 deaths; 24 of pneumonia, with 5 deaths; 49 of bronchitis, with 8 deaths; 17 of heart disease, with 5 deaths; 19 of hepatic disease, with 5 deaths; 13 of apoplexy, with 2 deaths; 3 of delirium tremens, with 1 death; and 95 of rheumatism. Among

* This part of the hospital is about to be demolished, and plans have been already drawn for a new wing to be added to the front building.

† What is here termed the back, faces the back of the new part of the hospital.

BATH.

cases under the care of the surgeons we note 18 burns and scalds, with 6 deaths; 56 fractures, with 6 deaths; 12 injuries to the head, with two deaths; 47 wounds, with 3 deaths. There were also 2 deaths from pyæmia and 1 from hernia.

121 operations (large and small) were performed in the two years, 1861 and 1862, 14 of which ended fatally. The operations of the classes selected for comparison were the following:—7 cases of amputation of the thigh, 6 of which were for disease (the cause of the remaining one not stated); 3 of those for disease were fatal. 7 cases of amputation of the leg, 1 primary, 5 for disease, and 1 doubtful. The primary amputation died (but in consequence of other injuries). 1 amputation of the foot and 1 excision of the knee (both for disease). 5 amputations of the arm, 3 primary, of which 1 died; 1 for disease and 1 doubtful, of which both recovered. 11 cases of herniotomy, of which 3 were fatal; and 2 of stone, of which 1 was fatal. To this list may be added a fatal case of removal of dead bone from the patella; a case of removal of the breast, fatal from typhoid fever; a case of amputation of the penis for cancer, fatal by pyæmia; and a case of removal of the lower jaw, fatal from the effects of chloroform.

Very little phagedæna or pyæmia seems to occur; but 2 deaths from the latter cause (1 after operation) were recorded in the year 1862. Latterly there has been a good deal of erysipelas in the hospital, but there has been a good deal also it is said in the town. In the spring of 1862 a child was admitted with typhoid fever, and died of it (the diagnosis was verified by post mortem examination); a girl in the same ward, suffering from epilepsy, was attacked about the time of the death just mentioned, and died in 11 days with perforation of the bowel; a convalescent patient also, in a surgical ward, was attacked at the same time, and died; the nurse of the ward in which the disease first occurred took the same disease, and recovered; and a nurse in the back house (but occupying the same dormitory with her colleague) likewise caught typhoid fever, and recovered. Typhoid was common in the town at the time, and two or three other cases of the disease were admitted into the hospital.

The site of the hospital is perhaps on the whole not a very favourable one; and the hospital presents doubtless defects in construction, but it is fairly well ventilated, and even the wards in the back house are by no means bad in this respect. It seems to be particularly clean and very well managed. It is obvious that cases are admitted into it with very little restriction, that infectious cases and patients with acute and grave diseases likely to be fatal are freely received, and that the cases treated comprise a fair number of accidents and a large proportion of operations. The difference in fact between the cases received here and those received into a London hospital are not very great. The usefulness of the charity is greatly enhanced by this; but the death-rate is necessarily increased. It is further increased by the fact that the relative number of medical cases admitted is considerably larger than in most English hospitals. J. S. B. T. H.

BEDFORD.

THE BEDFORD INFIRMARY appeared to us to be a good example of the ordinary country hospital. It is in an excellent situation, on high ground, with gravelly soil, in an airy well-exposed spot, and with a very large garden, used for the patients' exercise.

The whole institution consists of two parts; a general hospital for surgical and ordinary medical cases, and a fever hospital in a smaller separate building. No classes of cases are excluded from the institution, except small-pox and itch; the latter is treated out of the hospital; the former is sent to a special establishment under the roof of the union workhouse. As, however, there are no extensive manufacturing works, and no crowded population, the cases in the surgical wards are for the most slight. The patients are admitted by letter both to the General Infirmary and to the Fever Hospital; but it appears that such letters are easily procured. The letters are available indifferently to either part of the institution.

The hospital appears to be always pretty full, the average being above 75 for a total of about 80 beds in the general hospital. In the fever house, the average varies with the prevalence of such complaints, and had been low for some time previous to our visit.

Acute cases (except fevers) are comparatively rare, both on the medical and surgical side. In order to give some idea on this subject, we select the following particulars from the reports for 1860, 1861, and 1862.

The total number of patients admitted into the General Hospital was 2060, and the number of deaths 63, 3·05 per cent. Out of this total 117 were cases of phthisis (chronic medical), cancers 20 (incurable), pneumonia 7 (acute medical) *; 91 are classed as "uterine derangement," and 71 as "ulcer" (chronic surgical affections); 5 as strangulated hernia; 4 as calculus (acute surgical); 126 as simple fractures, many of them of the upper extremity (slighter surgical accident); 8 of compound fractures, and 30 burns (more severe accidents).

The analysis of the causes of death appears not to be attainable, but it would most probably show, in accordance with those particulars, that most of the deaths in the house were due to chronic and incurable affections, with a smaller per-centage due to the direct result of accident.

With this class of cases the proportion of operations is of course small; viz., 17 amputations of thigh, leg, arm, and forearm, 3 lithotomy, 3 strangulated hernia in three years.

As to the prevalence of hospital affections, no exact information is to be had. They are said to be exceedingly rare, and there were none in hospital at the time of our visit. Cases of erysipelas are removed into small separate wards, and such affections have never been known to spread. Phagedæna has not been seen here, at least of late years.

* The most common acute medical disease is acute rheumatism; but in the report this is not distinguished from chronic rheumatism.

The hospital appears to be a healthy place of residence, and not to be exposed to any spread of disease.

The construction of the hospital may therefore be said to have been proved by experience to be good, for the objects for which it is designed; viz., the reception of patients few of whom are very gravely affected, and the majority of whom are probably not confined to bed, and have sufficient opportunities for enjoying fresh air and exercise. Otherwise it would be too full for hospital requirements, since, although the ventilation is good, the hospital being built in the form of a rectangle open at one end, so that both sides of the wards are exposed and provided with windows, yet the space allowed to each patient is much below what appears necessary for acute disease, being below 600 cubic feet per bed in two of the wards accidentally selected for estimation.

With reference to the condition of the hospital at the time of our visit, there were 36 medical beds and 34 medical patients. Only 3 of the cases could be considered as other than chronic or trivial. In the fever house, containing 22 beds, were 8 cases of typhoid fever, and 1 of scarlet fever. There were 48 surgical beds, and 34 surgical patients, 11 of whom were females and 10 children; 8 accidents (several slight); 4 acute and 22 chronic cases; 2 simple fractures; 1 compound fracture; no cases of burn nor any of the secondary surgical complications; 1 operation of the classes selected for comparison, viz., a primary amputation of the thigh.*

In the three years 1860–62 inclusive, there were admitted into the fever house 145 patients, of whom 13 are reported to have died, a rate of 8·9 per cent.; 16 of these were cases of scarlatina, and 8 of variola, and it may be noticed as singular that no deaths took place in either class. J. S. B. T. H.

BRADFORD.

BRADFORD INFIRMARY.—The Infirmary at Bradford was in course of entire reconstruction at the time of our visit, only a few beds in three of the wards being in use for the reception of urgent cases. That reconstruction had two objects; to enlarge the hospital to the growing wants of the town, and to substitute a healthy and well-ventilated building for one which was obviously ill ventilated, and which was found to be even unhealthy as a dwelling house. It did not appear that the nurses, resident medical officers, and servants of the hospital had suffered from any serious disease, or that any death had occurred among them, but that they were never in a very good general state of health, some being always laid up, with diarrhœa, dyspepsia, sore throat, &c. This condition of things was attributed to the faulty construction of the infirmary, which was opened in the year 1835, the general ventilation of the whole house being scanty, and that of the individual wards very bad. This latter defect was due in great measure to the construction of the wards, which seem to have been built with more regard to architectural effect than to hospital uses. The windows were mullioned, and in four compartments, only one of which opened. The wards were of square shape, and the beds all huddled together. Ventilation had been attempted by means of ventilators into the roof in some wards, and an artificial system (Watson's) of ventilation was adopted a few years ago, but without success. The general plan of the building was that of a rectangular block, with projecting ends, a long corridor running down the centre, with small square shaped wards on either side of it. Six of the wards contained 8 beds each; one contained 11; 2 others 3 each; making the total number of beds 65†, which could be increased by 2 or 3 on emergency. The average number of the inmates was high; about 60. The wards were all lofty (14½ feet), and the average cubic space was high, not less than 1200 cubic feet in any of the wards, and a good deal more in some of them; but it was clear, on inspection of the wards still in occupation, that this large cube had been obtained at the expense of the area of the ward, and the beds being close together, and the ward ill ventilated, the hospital odour was very perceptible. The rules of this infirmary are the same as those in general use, viz., weekly admission by letter, and the exclusion of small-pox and all fevers. Consequently the cases are chiefly chronic, except the accidents, which in this large manufacturing town are numerous and severe. Thus in the year 1862, out of 457 patients admitted‡, 159 were on account of injury, and out of a total of 30 deaths, 14 were from injury. The death rate would be 6·5 per cent.

Secondary surgical affections are not very common. During 18 months there had been about 4 deaths from pyæmia. Erysipelas used to appear occasionally in the wards, and sometimes affected more than one case in the same ward, but never spread through the hospital. Phagedæna had not not been seen during the above period.

Wounds and amputations were believed to do well, but to heal slowly, and to require a large quantity of stimulants.

The number of operations of the classes selected for comparison which we could procure, since notes had been accurately kept (eighteen months), was only small, but showed very good results, as far as they go. They were as follows:—

Primary amputation of the thigh	3	1 died.	
" " leg	2	none died.	
" " forearm	2	"	
Excision of elbow	3	"	
Operations for strangulated hernia	3	"	

* This patient (a child) had recovered from an attack of tetanus after the operation.

† This is exclusive of seven children's cots distributed about the women's wards, but not taken into the regular account.

‡ The total in the report is 626, but this includes 169 re-admissions, or patients counted twice.

BRADFORD.

The good results of operations (assumed to be really a fact) is attributed by the resident officers of the hospital to the fact that most of the patients are working people in good health, well nourished, and of tolerably sober habits, and to the liberal allowance of support and stimulants.

The new infirmary at Bradford is an extension and remodelling of a building which has been in use for about 38 years. The disuse of this former hospital, and the necessity for spending a large sum of money on the construction of a new one, show forcibly the necessity of avoiding the use of small and ill-ventilated wards. Accordingly we append the plan of the old and of the new hospital, that the nature of the alterations may be apparent. It will be seen that in the old hospital there were a large number of small chambers, none of them containing more than eight beds, and none of them having windows opposite each other, consequently neither the whole house nor the individual wards were in a favourable position for efficient ventilation; but to add to this the windows were mullioned, with diamond-shaped panes, and only a small part of each opened by means of a pully and cord. Accessory ventilation was also provided through the ceilings, but did not remedy the foul condition of the wards. These faults were due to an unfortunate endeavour after architectural effect. In the new hospital another floor is added. The hospital premises are confined to the two upper floors, the one below being reserved for the dwelling-rooms of the inmates and the out-patient department, and the basement for the domestic offices. Thus an addition is acquired to the beds (120 instead of 70), while the patients and the permanent inmates of the house are kept better separated. Formerly there were wards in the floor above the basement, and the foul air from these was thought to affect the whole house, so that the nurses and officers were constantly out of health. Some of the new wards have been in use for a few months, and are found sufficiently ventilated, although the necessities of the place keep them full. The practice of the hospital lies chiefly in accidents and chronic cases.

T. H.

BRIGHTON.

THE SUSSEX COUNTY HOSPITAL stands on high ground towards the rear of Kemp Town, and looks over the sea. It is well and airily situated, and occupies, independently of a field behind it, 2½ acres.

It is a somewhat handsome building, symmetrical in its plan, but with each half of an irregular form, due apparently to the fact that additions have been made to it from time to time. There are three floors, and the wards on each of these floors, and in each half of the building, are, with certain minor exceptions, identical in their form and in their arrangement.

Thus, on entering the hospital by its main entrance, which is in the centre of the building, and turning from the hall by a short corridor to the left, we enter the first of the series of wards in the right wing. This is nearly square, reaches from the back to the front of the building (which at this part is narrow), has a large window at each end, an open fire-place in one corner, a door leading to a water-closet on one side of the back window, a door leading to a nurse's room, which forms the back of the passage leading into the ward, and on the opposite side to the entrance a large permanently open doorway, communicating with the next ward. Half of this ward only is used as a sleeping apartment for patients, the remainder being employed as a dining room. The second ward has the same general form as the one just described, but is about three times as large, and extends much further back. It has three windows on one side, two in front and one behind; besides which there are behind two doors side by side, one leading to the water-closet, the other to the scullery and bath-room. There are two fire-places. On the opposite site to that on which it joins the ward first described, but close to the front wall, there is another door, which conducts through a small passage (bounded by a scullery behind) to the third ward. This is about twice the size of the smallest ward, almost perfectly square, and has windows in front and in both sides; behind are two doors, one belonging to the nurse's room, the other opening into a bath-room, and from that into a water-closet. The chief differences presented in other parts of the hospital are: 1st, that the third ward in the left wing (both on the ground and first floor) is cut off from the rest of the hospital, and used for the reception of infectious diseases; 2d, that the first or small ward is in some instances used entirely as a ward, and in other instances devoted in whole or in part to the purposes of a day or dining room. There are also one or two small wards in the hospital. The large wards contain from 13 to 16 beds each. The outer or medium-sized wards are made to hold 10 beds in the general hospital, but six only in the fever department; and the smaller wards contain (according to circumstances) from five to seven beds. The beds generally are too close, not being more than two feet apart; but in the fever wards the distance between them is very considerable. The cubic space allowed to each bed, however, is generally ample, varying in the large wards between 1200 and 1400 feet, being in the medium-sized or outer wards over 1100, and in the fever wards over 1800. In the small wards the space per bed is less. Besides the windows, which are large and numerous, there are many ventilators in the walls and ceilings, to allow of the entrance and escape of air; and there are also gratings in the floor communicating with a shaft in the rear of the hospital, which are intended to admit fresh air, but the apparatus is said to be a failure. Ventilation seems to be generally good. On an evening visit, however, when the wards were closed, they smelt close and unpleasant. The hospital is warmed entirely by open fire-places, and lighted by gas. The walls are coloured below and whitewashed above. The wards were clean, and are scrubbed once a week; the hospital is thoroughly cleansed and whitewashed once a year. The premises are well drained, and the water closets in themselves good, but almost all of

them open directly into the wards (separated by a double door). There are numerous bath-rooms, and patients are bathed frequently, but not necessarily on admission. There is ample and good water supply. The beds are of iron, with curtains. The mattresses are generally of flock; but in the fever wards chaff is used, and this is destroyed on the termination of each case.

To each of the large wards there is a head nurse, an under nurse, and a scrubber; and to the small wards a head nurse and an under nurse, the scrubbing being done by a charwoman. There are two night nurses. All are resident. The staff consists of three physicians and three surgeons, two assistant physicians and two assistant surgeons. There are also a house surgeon and two resident pupils. Stimulants are freely used, especially in surgical and in fever cases. Leeching and cupping are at times employed, but on the whole depletion has fallen into disuse. Water dressing is the usual application to wounds. In cleansing wounds, sponges are frequently used, but tow is gradually coming into vogue.

Urgent cases and accidents are admitted without letter, and constitute nearly one half of the admissions. The admission day for patients with governors' letters is only once a week. The cases which are excluded are children under seven, women advanced in pregnancy, persons with disordered intellect, itch, or small-pox, or with confirmed phthisis. The hospital is not a convalescent hospital, but, nevertheless, as it stands on the sea-side, and has numerous subscribers in London and its neighbourhood, and indeed all over the country, it is made in a considerable degree to fulfil the purposes of a convalescent institution. Servants, farm and other labourers, form a considerable proportion of the admissions.

The hospital contains 155 beds, of which 86 are for males and 69 for females. About 88 are surgical and 67 medical (including 12 fever beds). Medical and surgical cases are in great measure separated, and in addition to the fever wards there is in the fever department a small ward with two beds for female syphilitics. The average daily number of patients resident during the year 1862 was 127.

At the time of visit the house contained 120 patients; of whom 70 were males, 50 females; and of whom 53 were medical, 67 surgical. Of the medical cases, 16 might be called acute and 37 chronic. Of the acute, 3 were cases of little or no importance; but 13 were severe, and comprised 8 of acute rheumatism (several having endocardial or pericardial complications), and 1 of acute bronchitis, besides 4 cases (2 of scarlet fever, 1 of diphtheria, and 1 of typhoid) in the fever wards. Of the chronic cases, 13 only (including a case of aortic aneurism) were of a nature necessarily tending to a fatal result. Of the 67 surgical cases, 15 were acute, 18 were accidents, and 34 were chronic cases. There were about 18 open wounds. Among the more serious cases were comprised, 1 case of burn, 3 of compound fracture (2 just well), and 9 of simple fracture. The cases in which operations of the selected classes had been performed were the following: 1 case of lithotomy, and 2 of amputation of the thigh for disease. There were 2 cases of erysipelas, and 1 of gangrene of the foot consequent on a smash.

The published reports make no distinction between medical and surgical diseases, neither do they give any information as to the nature of the affections for which patients were admitted, as to the cause of death, or as to the presence or absence of secondary complications. It appears that in the year 1862, 1064 patients were admitted, of whom 55 (5·16 per cent.) died; and that of these admissions 450 (194 accidents and 256 cases of emergencies) were without letters of recommendation. The per-centage of deaths in 1861 was 6·6, and in 1860, 4·9.

An examination of the list of the causes of death of patients kept in the hospital showed that out of the 55 deaths for 1862, 27, or nearly half, were in surgical cases. That of the 28 medical deaths, 7 were ascribed to fever, 5 to affections (acute or chronic) of the nervous centres, 4 to Bright's disease, and 4 to phthisis; and that of the 27 surgical deaths 14 were the result of accident, 1 of erysipelas, and 1 (in a case of thecal abscess) of pyæmia. Out of 76 deaths in the preceding year, half were medical and half surgical. The medical deaths comprised 5 from fever, 3 from diseases of the nervous centres, 7 from phthisis, 5 from renal disease, and 1 from pyæmia. The surgical deaths included 14 from accident (in 1 of which there was sloughing after amputation of leg, and in a second the patient had had amputation of leg performed), 5 from erysipelas (2 admitted with the disease, the 3 others attacked with the disease while in hospital after operations for epithelial cancer, disease of hip, and disease of tibia), 2 after amputation for disease of some portion of the lower extremity, 1 after amputation of the upper arm, also for disease, 2 after herniotomy, and 1 after lithotomy.

The operations performed during the year 1862 and the greater part of 1863 appear to be the following:—

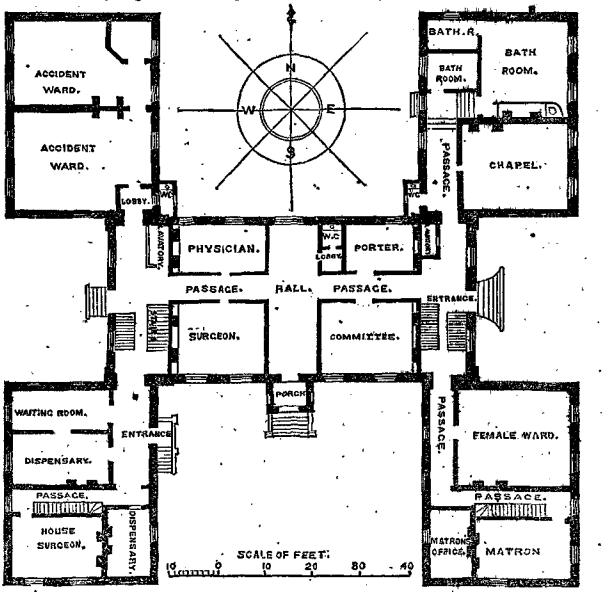
Amputation of thigh for disease	3	1	death.
„ leg for disease	6	—	„
„ „ for injury	3	1	„
„ arm for disease	2	—	„
„ „ for injury	2	—	„
Excision of elbow	1		
Lithotomy in children	1		
„ adults	3	1	„ (pyæmia.)
Strangulated hernia	9	3	„

The oral information which we received was to the effect that phagedæna had not broken out for at least five years, but that pyæmia and erysipelas followed operations

here as much as in London hospitals, and that hospital sore throat is not uncommon among pupils and nurses.

The Brighton Hospital must be undoubtedly regarded as a country hospital. Its construction and arrangements are good, but not faultless; and its situation, in point of salubrity, is admirable. Its death-rate is not absolutely high, yet it is high compared with that of many other country hospitals. This seems to depend partly on the presence of a fever department, partly on the admission and retention of chronic medical and surgical cases likely to prove fatal, and partly on the reception of a by-no-means inconsiderable number of serious accidents. The deaths quoted for two years form the chief basis for these statements. It is an interesting and important fact, however, that erysipelas is not uncommon, and not uncommonly proves fatal; and that pyæmia certainly does occur occasionally. J. S. B. T. H.

THE SUFFOLK GENERAL HOSPITAL AT BURY ST. EDMUNDS is a recent modification or reconstruction of an old building which had become too unhealthy to be any longer used as a hospital. The old building (the plan of which is appended



BURY OLD HOSPITAL.

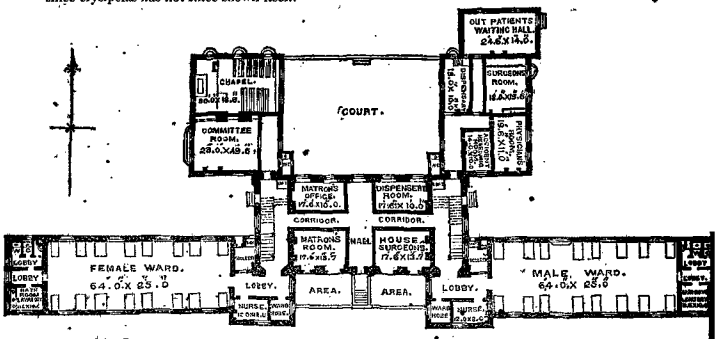
for contrast with that of the new one) was not originally designed for a hospital, but for a depôt of stores for the militia, and was enlarged and converted to the uses of a hospital after the conclusion of the great war. It will be seen that it possessed no capabilities for ventilation; the wards were all small, close, and very confined (the cubic space per bed is believed not to have been 400 feet); the wards seem also to have been deficient in the necessary arrangements for cleanliness. The consequence was that erysipelas became more and more prevalent, till it attained such a height and became so fatal (e.g. out of four operations performed on one day two of the patients died of erysipelas) that it became impossible to perform surgical operations.

It seems that this result was due almost entirely to the faulty construction of the hospital. The climate of Bury is said to be cold and damp, the drainage bad, partly into cesspools, and partly into the ditches around the town, from which troublesome effluvia arises. Still the mortality of the place is not high (25 in 1000); and those morbid influences

would the less affect the hospital as its situation is high and airy, away from the chief part of the town and from all such sources of disease.

In all other respects the hospital is most favourably situated, and ought to present the best results. The patients are agricultural people of quiet and simple habits, the letter system and weekly recommendation being strictly adhered to, and cases of fever being excluded. The cases admitted in that way are mostly chronic, while the accidents are neither very numerous nor as a rule severe. It would not appear too much to say of such a hospital, that it ought to present hardly any mortality, except as the direct result of injury, and from chronic visceral diseases.

What the precise amount of the mortality from erysipelas was, what proportion it bore to the admissions and to the number of cases of operation, how long the hospital had been infected by it, and whether it was increasing as the wards became more and more saturated with the vitiated atmosphere, would be interesting questions, but no records exist by which they can be answered. All we can say in this place is, that the evil appeared sufficiently great to call for the entire reconstruction of the building; and we are enabled to add, that as far as a year's experience goes the measure has been successful, since erysipelas has not since shown itself.



BURY NEW HOSPITAL.

The principal objects in the new building were to secure ample ventilation by means of windows facing each other, a sufficient cubic space per bed, space enough between the contiguous beds, proper accommodation for the cleanliness of the patients, and efficient drainage outside of the hospital. The windows are wide, reaching to within two feet of the ceiling, but not coming down more than to within four feet of the ground. This perhaps prevents the patients from seeing out without standing up, but it also defends the beds from any draught. The cubic space is 1500 feet per bed, allowing for the ward being quite full. Two beds are placed between each pair of windows, at a distance of about 3 feet from each other, and about 8 feet from the next bed. This is perhaps not the best arrangement that could be devised, but is necessitated by the width of the windows. The arrangements for the patients' accommodation is most excellent, there being a large high lobby at the end of each ward, plentifully ventilated, and containing three closets (one for washing out bed pans, &c.), and a lavatory divided from the closets by a small passage, in which are washing stands and a large bath. At the opposite end of the ward is a nurse's room, with a window commanding the ward, and cupboards or wardrobes for the patients' clothes, and (in separate cupboards) for their food and medicines. Nothing is kept in the ward. This arrangement also has its inconveniences, but no doubt keeps the ward from litter, and avoids the tendency which patients have (especially in country hospitals) to choke up the water-closets by throwing things down them. The cleanliness of the wards is provided for by having the walls coated with Parian cement, and the floors of oak wood, coated with beeswax and turpentine, and dry rubbed. The drains are all carried outside of the hospital, except one which runs under the corridor, but is enclosed in a casing of cement, and tiled over.

The out-patients' department is carefully separated from the in-patients' and the general hospital, as will be seen by a reference to the plan.

The plan of the new hospital will sufficiently show those particulars. It will also show how the new hospital has been modelled, as it were, on the old, a plan of construction which necessarily entails some little difficulty in providing for the general ventilation of the building as a whole.

At the time of visit 78 beds appeared to be made up. The hospital contained 61 patients, 22 of whom were medical, out of whom 5 were or had been acute. Of the 39 surgical cases, were 11 accidents, including 4 simple factures, 3 compound fractures, and 1 scald; 4 were

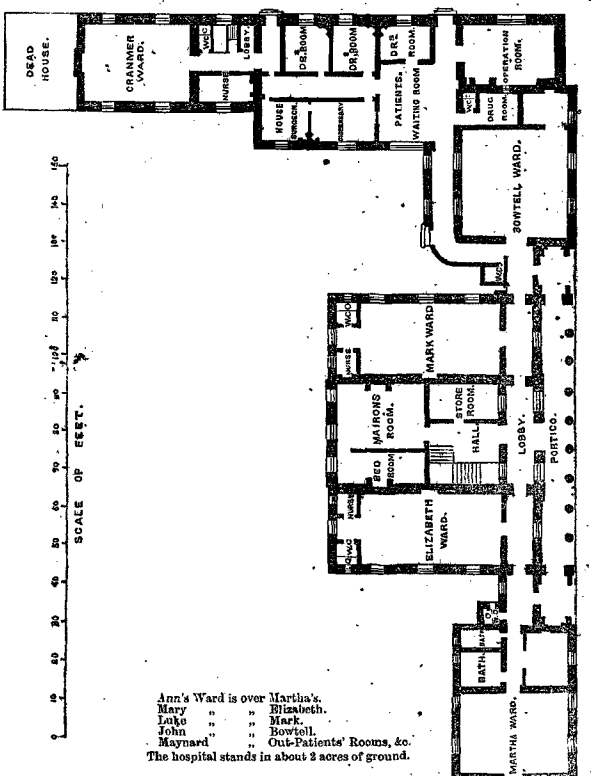
acute diseases, including 1 amputation of the thigh for disease; 24 were chronic or trivial. There were 9 open wounds or sores.

We could obtain no information as to the number or success of operations in past years, beyond the general statements given above; and the opening of the new hospital is too recent for any estimate of its success to be formed at present.

J. S. B. T. H.

ADDENBROOKE'S HOSPITAL AT CAMBRIDGE is in connexion with the school of medicine in the University, and receives patients from a large tract of country; but accidents do not come from such long distances as formerly, other institutions having been established in various parts of the country.

The hospital stands low. It is situated in the town, near the entrance by the London road. Its position is thought to be rather damp. The building is an old one, with additions made to it at various times. The plan annexed will give a good idea of its general arrangements. Two floors (ground and first floor) are at present used as wards. The original building (1766) contained only four wards; viz., Mark and Elizabeth on the



Ann's Ward is over Martha's.
Mary " " Elizabeth.
Luke " " Mark.
John " " Bowtell.
Maynard " " Out-Patients' Rooms, &c.
The hospital stands in about 2 acres of ground.

ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

ground floor, and two others corresponding on the first floor; next the wings were constructed, each containing one ward on either floor; afterwards the fever-house, containing one ward in each floor, was added in a separate building, which was subsequently connected to the rest of the hospital by a portion in which the house surgeon's sitting room and the out-patient department were placed; and, lastly, another ward was built over this last or connecting part.

The building, as a consequence of this patch-work construction, has no regular plan, and can have no thorough ventilation; nor are there wanting obvious faults of hospital construction, for example, the original intention of separate fever wards appears frustrated by an arrangement which throws them back into the general hospital; and the position of the out-patient department is highly inconvenient, even if its close proximity to the fever-house is free from danger. The accommodation for the in-patients also is insufficient; the cubic space per bed is not large enough (in any ward except the one last constructed); the sanitary arrangements of the wards are defective, as they have no thorough ventilation, and the corridors are destitute of any ventilation by means of a sufficiently wide staircase, so that no ventilation of the wards can be effected by their means. The arrangements also for baths are extremely defective, and the water-closets are placed in the corners of most of the wards. The sub-division of the hospital into small wards necessitates costly and imperfect nursing and supervision.* Ventilation is also further obstructed by surrounding the beds with curtains.

Considering all these theoretical objections, to which many others might have been added if we had thought proper to adduce the whole substance of the reports referred to below, it might be said that the practice of the hospital ought to be very unsuccessful, yet this is not so. Surgical operations are known to do very well here, and the annexed list will support this statement. It will be seen from that list that amputation of the thigh for chronic disease of the knee-joint has been uniformly successful during three years (in which 11 operations were performed); that one patient survived both amputation at the hip-joint and excision of the elbow; that there was no death after lithotomy during the three years out of 10 cases, 3 of which were adults;† and that pyæmia, though not unknown, rarely follows operations. Hospital affections generally are rare; erysipelas is seldom seen, and appears never to prove fatal; it does, however, sometimes prevail in the town, and is at such times more common in the hospital. Phagedæna is still more rare, but a fatal case had occurred shortly before our visit. No disease of any kind has spread in the hospital, and the health of nurses and officers is excellent. The death-rate over three years was 5·5 per cent.

When we come, however, to examine into other circumstances we shall cease to wonder at this success, even allowing that the above theoretical objections deserve (as, in our opinion, they certainly do deserve,) the weight attributed to them.

In the first place, the system of weekly admission by letter tends here, as elsewhere, to restrict the scope of the charity, and to lessen the gravity of the cases. Out of 1911 patients admitted in three years 231 only were taken in without letters. Therefore, the cases of urgent danger are few, and of those fewer still are cases of acute and profuse suppuration. Hence there is but little traumatic atmosphere in the wards‡; and this is further diminished by the practice, which we hold to be a very salutary one in such hospitals, of mixing the surgical and medical cases in the same wards. A great number of chronic cases and nervous disorders are admitted; epilepsy is often admitted, and kept a long time.

Again, the hospital appears to be never at all full. Out of 102 beds which it contains, only an average of 78 were occupied in 1862; at the time of our visit there were only 67, but this was in the middle of the summer, and at a time when there happened to be no fever in the town.

Lastly, the patients are almost all agricultural labourers, of good constitution and quiet regular habits, who do not require and are not used to the alcoholic stimulants which appear necessary in large cities, and who are for the most part operated on for chronic strumous diseases of the joints, the most favourable class of cases for recovery.

The question, which is forcibly presented to any one looking over this hospital, of the propriety and advantage of having separate fever wards, will occur in many places of this report. In this hospital, however, the more decidedly contagious diseases, small-pox and scarlet fever, are excluded from the fever wards; and, when this is the case, it appears to us to be sufficiently clear that the cases may be placed in the ordinary wards without excessive danger, so long as those wards are properly constructed and the beds sufficiently far apart.

Out of 67 patients in the hospital at the time of our visit, 31 were medical, 5 or 6 of whom were suffering under diseases of the acute class. Of the 36 surgical cases, 7 were accidents, including 1 compound and 1 simple fracture and 1 burn; 8 cases were acute, including 1 lithotomy and 2 excisions of the knee; the remaining 21 cases were chronic. There were 19 cases of open wound, many of them chronic.

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* All these objections to the construction of the hospital, and many more which we do not think it necessary to recapitulate, are to be found in the report of a committee of governors, dated September 22, 1862, and one drawn up by Mr. Digby Wyatt, architect, in February 1863.

† In the statistics of lithotomy, given by Mr. H. Thompson, in his recent work on that subject, Cambridge has by far the lowest death-rate.

‡ At the time of our visit there were only 19 open wounds in the hospital, and many of these were trivial.

CAMBRIDGE.

The list of operations at Addenbrooke Hospital during the three years 1860-62, inclusive, is as follows:

Amputations of the thigh -	Primary - -	3.	2 died, 1 of tetanus.
„ „ -	For disease - -	11.	
„ „ -	After excision of knee	3.	3 died, 1 of pyæmia.
Amputations of the leg -	Primary - -	1.	1 died, tetanus.
„ „ -	For disease - -	6.	1 died.
Amputations of the arm -	Primary - -	3.	
„ „ -	„ at shoulder-joint	1.	1 died.
„ „ -	For disease at shoulder-joint - - -	1.	
Amputations of the forearm	For disease - -	8.	
	Total amputations -	37.	8 died.

Excision of knee - - -	3.	3 died, all after amputation.	
„ elbow - -	1.		
„ shoulder - -	2.	1 died.	
„ wrist - -	1.		
„ ankle - -	2.	1 died.	1 amputated.
Strangulated hernia - -	5.	1 died.	
Lithotomy: Adult - -	3.	No deaths.	
Child - -	7.		

T. H.

CANTERBURY.

THE KENT AND CANTERBURY HOSPITAL is one of the purely country class, and is governed under the regulations usually adopted in such hospitals. The patients are admitted weekly by letter, except a small proportion of accidents and emergencies*, and patients labouring under infectious diseases are by rule excluded. This rule was neglected a short time since, when there was an unusual prevalence of typhoid fever, and admission was granted to a few cases; but this was followed by the spread of a feverish affection (supposed to be typhoid) in the house. Many persons were attacked, but none died.

There is, therefore, little to distinguish this from the great majority of country hospitals in its constitution. In situation the hospital appears very favourably circumstanced, standing, as it does, nearly out of the town, and at the highest part of it, in a large plot of open ground, and looking into the open country.

The plan of the hospital is annexed (See next page). It will be noticed that none of the wards, except two on each floor, have thorough ventilation, and the cubic space appears small in all the wards, 800 to 900 feet. Two floors are used as wards. The number of wards is 16, and the number of beds is 120. The two largest wards in the house contain 13 beds each. The average number of patients, however, is much below this. In 1862 it rose to 81, having never been higher than 78 during the previous five years. This limited pressure on the resources of the charity seems to be due to no lack of funds; nor ought it to be due to any want of proper cases for admission, since Canterbury is a large town, and has lately suffered a good deal from fever, and no doubt other acute diseases are proportionally prevalent; but here, as elsewhere, the letter system appears to check the operations of the hospital. The deficient number of patients, however, does not cause any increase in the space allowed in the wards, but leads merely to the disuse of a proportional number of the wards. Thus, at the period of our visit, five out of the 16 wards were empty; but of the other 11 eight were filled up to their complement, and in the other three there were only five vacancies. The ventilation is by the windows, doors, and fire-places mainly; the windows and doors being kept open as much as is possible in small wards filled with agricultural people; but about 18 years ago, the ventilation being clearly inefficient, and the hospital unwholesome, ventilating shafts were contrived from the ceilings into tubes running by the side of the flues, and ventilators over the doors and in the windows. These have partially remedied the defect, but not completely. The wards appear close; the beds are crowded together, and covered with curtains; the water-closets are offensive, and open immediately out of the wards, so that in certain states of the wind the bad odour is plainly perceived in the wards. The wards are scrubbed twice a week, and left to dry. The mattresses are of flock, and are hung out to ventilate after a death. All beds are taken down and examined twice a year. There is no separation between medical and surgical cases. The drainage of the hospital is good, but that of the city is imperfect, and some part is not drained at all. The water supply to the hospital is difficult. There is a large tank on the top of the building, which is kept filled by the labour of the prisoners on the treadmill in the adjoining gaol; but it seems that the water supply is still not unlimited. The hospital is served by two physicians and four surgeons. There are four head nurses and four under nurses, who also take the night duty, but do not scrub the wards. The treatment seems chiefly supporting and tonic, much expense being especially incurred in the use of quinine, in consequence of the prevalence of ague in the neighbourhood. Venesection, however, is occasionally practised.

The cases admitted are for the most part chronic. Accidents are, as a rule, neither very frequent nor very severe, nor are operations common. We are in possession of a

* In 1861 there were 54 accidents and 25 emergencies out of a total of 615 in-patients.

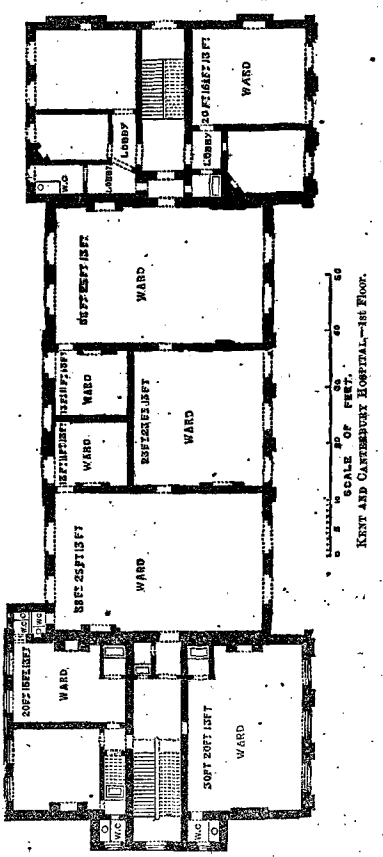
list for one year only of the operations of the selected classes, April 1862—April 1863. They were as follows:—

Amputation (primary) of the thigh	1	1 died.
" " arm	1	—
Hernia	5	3 died.
Lithotomy	3	1 "

The deaths in 1861 and 1862, out of 1243 in-patients, were 65, or 5·2 per cent. They seem caused chiefly by visceral diseases, and by surgical operations and affections. Thus out of 18 deaths occurring in the first half of the year 1862, 9 were due to chronic visceral diseases, and 2 to cancer, 1 to peritonitis, 1 to typhus, 2 to surgical operations, 1 to pelvis abscess, 1 to phagedæna, and 1 to burn. Inspection of the diagnosis of cases admitted for half a year enables us to state that the great majority (almost the whole) of the medical admissions are on account of chronic diseases, almost the only exception (and that apparently depending on temporary causes) being a few cases of typhoid fever.

The surgical cases, except the accidents, are also chiefly chronic, and out of the accidents a good many would be treated as out-patients at hospitals more pressed for room.

Thus all the requisites for a low death-rate and successful results of practice appear to be combined in this infirmary; a good country situation, a class of patients of the better agricultural kind, a system of admission which precludes the prevalence of acute diseases, and a situation not much exposed to serious accidents; yet it appears that the defects in the construction of the hospital (which, trifling as they may at first sight appear, do tend to prevent any thorough ventilation of the whole building or of its individual wards,) fully counterbalance the advantages of the situation, and lead to a prevalence of hospital diseases much greater than is to be expected from the class and the number of cases treated.



We have of course no definite statistical information as to the prevalence of erysipelas, phagedæna, and pyæmia; but it appears that erysipelas occasionally breaks out and was prevalent in the winter of 1862, and that phagedæna has been seen, though not in a severe form. The first case of pyæmia proved by postmortem examination was in a patient who died in 1862 after lithotomy. These hospital affections are sometimes separated from the other patients.

On the whole it appears to us that one great advantage which the circumstances of a country hospital allow has been neglected here, viz., to take advantage of the slack demand for beds in order to correct the deficient space allowed by the original plan. This seems worth doing, even at the expense of a few extra nurses, &c. Again, this hospital seems to confirm the opinion that country hospitals are not more healthy than town hospitals, unless they are as well constructed.

At the time of our visit, as above mentioned, 5 wards, containing 22 beds, were unused. The remaining 98 beds contained 93 patients, of whom 46 were medical, all but 3 of these being chronic or trivial cases. Of the 47 surgical cases, 16 were accidents, comprising 9 simple fractures, 1 compound fracture, and 2 burns and scalds; 7 were acute cases, comprising 1 lithotomy and 1 herniotomy; 24 were chronic. There were 21 open sores. No cases of erysipelatous or hospital affection were then in the house.

J. S. B. T. H.

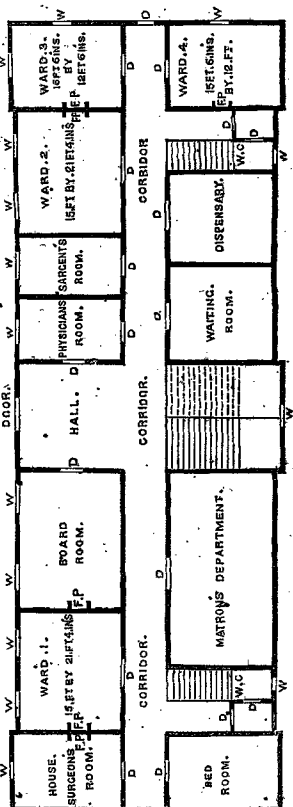
THE CUMBERLAND INFIRMARY, CARLISLE, lies quite on the outskirts of the town to the north-west, stands 30 feet above the river, and commands a fine view. It is surrounded by six or eight acres of ground which belong to the institution, and to which patients have free access.

The hospital is an oblong building, and consists of basement, attics, and two intermediate floors. The two latter alone contain wards.

The ground floor has an entrance hall in the centre, and behind it a staircase, separated from one another by the corridor, which runs transversely the whole length of the building. In front the corridor has, on either side of the entrance hall, several rooms of various sizes opening into it; and behind, it has also several rooms correspondingly arranged, and two side staircases, at the back of which are the water-closets.

The arrangements on the first floor differ somewhat from those just described, from the fact that the operating theatre takes the position of the entrance hall, and that the back portion of the building rises above the ground floor at the two extremities and in the centre only, and thus leaves two intermediate portions of corridor to communicate directly by windows with the external air.

The corridors and staircases are large and well ventilated. The wards are ten in number, four on the ground floor and six on the first floor. Of the former, two contain six beds each, and two three beds each; of the latter, one contains eleven beds, two contain six beds each, one four beds, two three beds each, and one two beds. The wards are small, but (especially those on the first floor) very lofty. The windows are large sash windows, placed either on one side only, or in the wards at the angles of the building on two contiguous sides. The wards have also ventilators in the walls, which communicate with the external air and with the corridors; they have open fire-places and gas. There is no artificial ventilation and no artificial heating, except for the lower corridor, which is warmed in winter time by hot-water pipes; the warmed air ascends hence into the upper corridor, and both are thus kept at a comfortable temperature.



The wards at the time of our visit were clean, but close; from the fact that the windows were mostly closed. They are scrubbed weekly, and the hospital is cleansed and white-washed thoroughly once every year or two. The actual cubic space allowed to each bed seems to be not inconsiderable, but the beds are very close to one another, and in many cases touch. The bedsteads are of iron, without curtains; the mattresses for fracture cases are of horse-hair; for other cases are filled with straw, which is frequently destroyed.

The water-closets for patients are two on each floor, at the back of the corridors; they are in all respects good. There is one bath-room on the first floor for the whole hospital. Patients are bathed, as a rule, on admission. Water is laid on, and is good and abundant.

Two nurses only are usually employed. They live in the house. A night nurse is hired occasionally. The medical staff consists of a physician, a surgeon, and assistant surgeon, a resident medical officer, and generally a pupil or two. It is not the practice to deplete; but stimulants are often largely used. Water dressing and wire sutures are employed in the treatment of wounds, and they are cleansed sometimes by sponges, but generally by tow.

Patients are admitted by governors' letters, but about a fourth of the total number enter the hospital as accidents and casualties. They come chiefly from the surrounding country, but many also from the town, and they consist chiefly of agricultural labourers, weavers, and railway labourers. Paupers and domestic servants are received only on payment of 12*s.* per week, and hence are not numerous.

All fevers and other infectious cases are excluded, as also are female syphilitics. Incurable cases, children under five, and male venereal cases are also excluded by rule, but are occasionally admitted. There is no separation of diseases, medical and surgical cases are mixed up together.

The hospital contains 50 beds, 33 for males and 17 for females. The daily average number of occupants during the year 1862–68 was 46, and the average stay in the hospital about five weeks.

At the time of visit there were 42 patients in the house, of whom 32 were males, 10 females, and of whom 10 were under the care of the physician, and 32 under the treatment of the surgeon. The 10 medical cases were all chronic, the three most serious being cases of heart disease, syphilitic disease of larynx, and pleurisy. Of the surgical cases, the great majority were chronic; there were, however, 8 cases of accident (including 3 simple fractures), a child convalescent from lithotomy, an operation for the radical cure of hernia, and perhaps 2 or 3 other cases which might be regarded as acute or serious.

During the year ending 31st July 1862 414 cases were admitted into the hospital, and 23 (or 5·5 per cent.) died. It is not easy, from the system of classification adopted, to distinguish the medical from the surgical cases. It seems, however, that medical cases are in great minority, and there is no doubt that most of them are chronic. Accidents, however, are numerous, for 112 (rather more than one fourth of the total number of cases) were admitted during the year 1861–62; of these, 2 were compound fractures of the skull, and 14 were compound fractures and 18 simple fractures of the upper or lower extremities; 7 were burns. Besides these the list of cases comprises 3 of tetanus, 4 of hernia, and 1 of pyæmia. Of the 23 deaths, 7 were in medical cases, 14 in surgical, and 2 are unspecified. The medical deaths comprise 1 death from pneumonia; but the remainder were due to chronic affections. The surgical deaths include 3 from tetanus, 3 from burns, 1 from fracture of the skull, 2 from hæmorrhage after amputation of leg, 1 from chloroform, 1 from pyæmia, 1 from strangulated hernia, and 1 from compound fracture.

In the year following, 412 cases were admitted, and 19 (or 4·6 per cent.) died. The admissions include 2 cases of vesical calculus, 2 of hernia and 102 accidents. Among the latter were 10 cases of compound fracture of the upper and lower extremities, 22 simple fractures, 8 burns and scalds, 6 cases of concussion, 3 gunshot wounds, and a dislocation of the spine. Of the 19 deaths, 7 were in medical and the rest in surgical cases. The former were all in chronic cases. The latter include 2 deaths from burns, 2 from shock, 2 from compound fracture, 1 from dislocation of the spine, 1 from wound of the thigh, 1 from rupture of the spleen, 1 from pyæmia, and 1 after lithotomy.

There appears to be no available record of operations; a fair number, however, of capital operations appear to be performed. There has been very little pyæmia or erysipelas lately; but during a period of two or three years (which terminated three or four years ago) erysipelas, and more especially pyæmia, prevailed among operation cases. During this period two cases of pyæmia after tying varicose veins occurred within a short time of one another. No case of pyæmia occurred for several years after the foundation of the hospital in 1841; but while the railways were being made serious accidents became numerous, and the mortality from operations was distinctly increased. Mr. Page, who has been surgeon to the hospital from its foundation, gives the above information, and informs us that in the course of his hospital practice he has performed over 80 operations for stone, with only two or three deaths. The ventilators between the wards and corridors were made after the last epidemic of pyæmia.

The hospital appears to us to be a clean, well-built, and on the whole well-arranged institution. But there are obvious faults of construction, of which the chief are smallness of wards, close packing of beds, and waste of space in the formation of corridors. The health of patients generally (excluding accident and operation cases) seems not to be affected by hospital atmosphere, neither do patients become attacked

by secondary diseases; but infectious disorders are not admitted, and most of the cases are chronic. It is an interesting fact, that though this hospital is a country one, and stands in an admirable situation, pyæmia has on more than one occasion prevailed, and that one of these outbreaks was markedly associated with comparative concentration of traumatic atmosphere.

There is a fever hospital in the town for infectious diseases, and a convalescent hospital at Silloth (20 miles off), to which many of the convalescents are transferred.

J. S. B.

ST. BARTHOLOMEW'S HOSPITAL, CHATHAM.—This hospital is just completed, but at the time of our visit had not been opened for the reception of patients. It consists of two wings of wards, separated by a central block, in which are contained the out-patient department, the lift for patients, the operating room, and the dwelling rooms for officers, &c. The wings are not of the same size; the smaller is intended as a female Lock hospital, and is to contain 30 beds, viz., two large wards of 12 each, and two small (or separation) rooms of three beds each. The plan of the large ward is simple, and is shown on the annexed sketch. The room is oblong, narrow in proportion to its length; it has a door from the staircase at the corner of the nearer end; the rest of this end is occupied by the nurse's sleeping-room, which has a window of communication with the ward, besides its own windows. Along either side of the ward are six long narrow windows (common sash), between each pair of which is a bed, 12 in all. At the far end of the ward is a fire-place in the middle, and a window on each side; and at either corner of this end are doors, leading into a bath-room on one side and the water-closets on the other. The bath-room is commodious, has a fire-place, and is intended to serve also as an operating room for minor operations. In the corner is a door opening into a large shaft, by which dirty linen is to be shot down into the laundry. The water-closets are separated from the ward by a small lobby with double doors. The ward is warmed also by another fire-place at the other end, i.e., in the party-wall between the ward and nurse's room. There is no other artificial warmth. The windows reach nearly to the ceiling, and seem adequate for ventilation. There is no artificial ventilation at present, though it is believed that it will be necessary to contrive some scheme.* The ceiling is of whitewash, with oak (or oak-coloured) beams intermixed, which give it a cheerful appearance. The walls are of a somewhat rough and soft stucco. The beds are narrow, of iron, with flock mattresses, but hair mattresses with boards underneath will be used for fractures, &c., and straw mattresses will be partially used in the Lock wards. The separation wards are less suited to hospital purposes. They are square, with narrow windows on all sides, so that it seems difficult to give comfortable accommodation to three beds without exposing some to the direct draught and glare from the windows. The cubic space per bed we could not learn, but it was thought to be high (between 1000 and 1200 feet?). The distance between the beds in the long wards was about five feet.

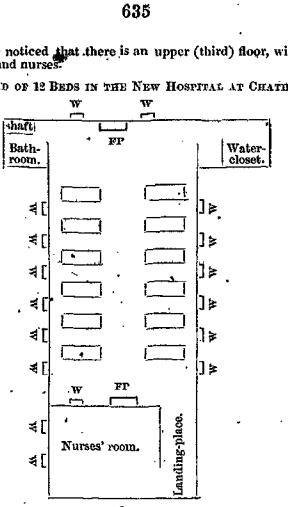
The other wing is for general purposes. It contains two large wards on the first and second floors, as in the Lock wing, and on the same general principle of construction, but longer, having 10 windows instead of six along the side, and therefore 20 beds instead of 12; but the same breadth, distance of beds, arrangement of windows, fire-places, nurse's rooms, &c. It should have been mentioned that the bedsteads are "half-testers," with curtains round the head of the patient. The lower ward is for men, the upper for women; medical and surgical cases intermixed. The lift for the patients starts from below, in the out-patients receiving hall, and comes into the operating room on the first floor. On either side of the operating room is a "separation room," like those above described, but somewhat larger and more commodious. They are intended for male and female accident and operation cases respectively. And besides these there are two other separate rooms on the ground floor. Thus there would be for general purposes 40 beds in the large wards and 12 in the separate rooms, or say 10, for it seems likely that the rooms on the ground floor would only accommodate two beds each; thus the total of 80 beds would be made up. On the basement floor is the out-patient department, very neatly arranged, and quite shut off by means of a door from the general hospital; also the two separation rooms (intended for noisy cases, cases of erysipelas or of infectious diseases, &c.), and two convalescent or day-rooms for men and women; the latter very narrow, dark, and cheerless as it appeared to us. Outside are laundries and wash-houses, with washing machines, &c.

These are the chief arrangements of this hospital. They struck us as good for their object, that of a small country hospital, with no great proportion of accidents or urgent cases. If the latter were to occur in any great proportion the large wards would have to be exclusively appropriated to them, and would not be found to be very conveniently situated, and there would be no accommodation for chronic cases without exposing the latter to the risk of infection. The utility of so many small rooms is doubtful. The building seems deficient in that thorough ventilation which a good large roomy staircase would afford. The medieval style of it also seems to necessitate narrow windows and an absence of light. Also the plan is confused, and the rooms are all up and down little flights of stairs, never on the same level. But on the whole the hospital is a well-constructed one.

* From hearsay information given to us since the opening of the hospital, we conclude that additional heating will also be requisite.

It should have been noticed that there is an upper (third) floor, with rooms and dormitories for servants and nurses.

A WARD OF 12 BEDS IN THE NEW HOSPITAL AT CHATHAM.



T. H.

CHELTENHAM HOSPITAL

CHELTENHAM HOSPITAL is finely situated in a very open and agreeable part of the pleasant town of Cheltenham, having a mild and healthy climate and many of the conditions of extreme salubrity. The lower classes, however, are said not to be well off or well employed here; and, though the richer parts of the town look spacious and airy, the dwellings of the poor are said to be close and crowded. The prevailing diseases are, therefore, principally those of bad nutrition.

The hospital is of modern construction (opened in 1849), and is extremely well adapted for its purpose. It was pronounced by Sir G. Ballingall a model of what a hospital should be. The general plan of the hospital is similar to that of St. George's Hospital, London, viz., a central building, with a corridor running down the middle, devoted to offices on the ground floor, and having small wards on the first floor, and two ends or wings standing at right angles to the central building, and having wards on either side of the central corridor, the axis of the wards being perpendicular to the direction of the corridor. This arrangement allows the chief wards to have windows opposite each other, and allows also of a free current of air through the main corridor and up the staircases which are at each end of the building. Besides the windows there are air-shafts in the floor and roof of each ward. The patients have an ample exercising ground (about three acres). Additions have been made at either end of the main building; a chapel at one end, thus setting free a ward which had been used for this purpose; and two casualty wards at the other end, for males and females. These are of small size, and are only intended for the temporary reception of cases of surgical injury, which after a few days sojourn here are either to be sent out or transferred to the main hospital. These casualty wards are warmed by a hot-water apparatus, and the halls and corridors by hot air. The casualty wards, however, do not seem very much used.

The patients are admitted weekly by letter, except in cases of accident, the proportion being 1183 by letter to 345 without letters, in the admissions of three years. All infectious diseases are rigidly excluded; consequently the medical cases are chronic. The hospital has a great deal of spare room, the funds not being at present sufficient to keep all the beds filled. The building is constructed for 92 patients, but the average of patients is only 56. At the time of visit there were 52. There is no strict separation between medical and surgical beds, except that some wards are reserved for surgical patients (as the casualty and a small operation ward), while in others medical cases are placed by preference. Another cause which tends still further to keep acute cases out of the hospital is, that there is an out-patient department attached to the hospital, from which patients can be seen at their own houses. This is much preferred by most of those who are too ill to quit their beds.

Of 52 patients in the hospital at the time of visit, 18 were medical, all of which, except 3, were chronic cases; of the 34 surgical patients 12 were cases of accidents, including 4 simple and 2 compound fractures and 2 burns; there were 12 acute surgical cases, including a primary amputation of the leg and another of the arm, and 10 chronic

CHELTENHAM.

cases. Surgical operations are not frequent. Of those selected for comparison there were performed in the year 1862 only 6; viz., 2 primary amputations (of the leg and fore-arm), 3 operations for strangulated hernia, and 1 lithotomy (aged 13). One of the cases of hernia proved fatal.

There were 46 deaths out of 1528 patients admitted during the three years 1860–62, or 3·01 per cent. Out of 16 who died in 1862 there were—

Chronic medical and visceral disease, 9; viz.,
Phthisis 3, organic disease of heart 2, of kidney 2, of liver 1, of brain 1.
Acute medical cases, 4; viz.,
Bronchitis, pneumonia, hydrothorax, and abscess of lung.
Cancers and tumours, 1.
Acute surgical affection, 2 (strangulated hernia and tetanus).

Secondary hospital complications seem rare. A few cases of erysipelas sometimes occur, and on one occasion, soon after the opening of the hospital, erysipelas showed a tendency to spread in one of the wards, which was soon checked by emptying the ward affected. Phagedæna is nearly unknown, and only one case of pyæmia was remembered, post-mortem examinations having been made in almost all cases, but no distinct record kept.

The place is excellently ventilated, and the drainage, water-closet arrangements, &c., are very good; but the beds are rather more numerous in the wards than would be proper for acute cases, none of the large wards, if our measurements are correct, having 1000 cubic feet per bed.

T. H.

CHESTER.

THE CHESTER INFIRMARY is situated within the town of Chester, close to the walls, and looks across the valley of the Dee towards the Welsh mountains. The front faces the west. There is a garden in front and one behind, which are used respectively by male and female patients.

The hospital has three floors. The ground floor is used for out-patients and other purposes. The first and second floors are devoted exclusively to the reception of in-patients. The hospital forms a square block of buildings enclosing a central court. This court was originally of fair dimensions; but changes and improvements have necessitated considerable encroachments on it, so that at the present time it is much cramped and confined, and of little use or ornament. There is on each floor, running round the inner aspect of the building, a corridor, out of which on the one side the wards open, and from which on the other side (at least from that portion of the corridor which belongs to the right and left wings of the building) the water-closets, bath-rooms, and sculleries project. The wards have open fire-places, sash-windows on one side only, or in some cases at one end as well; in some instances communications have been made between adjoining wards, and in the wards on the top floor there are ventilators in the ceiling. The walls are whitewashed, and some of the floors are oiled. The wards vary a good deal in size; of those on the first floor, four measure 49 by 22 feet, and two measure 25 by 18 feet, all being 13 feet high. The wards on the second floor partly correspond to and partly differ from those on the floor beneath, but have on the whole a general resemblance. Most of them are lofty, with sloping roofs; but two or three of the smaller ones are nine feet high only, and have flat ceilings. One or two are provided with skylights. The number of beds per ward varies from 13 to 4, the cubic space per bed from over 1000 to about 1400 feet. Altogether there are 16 wards, of which 7 are on the first floor and 9 on the second floor; and in addition two dayrooms, both on the first floor. The ordinary medical and surgical cases occupy the wards below and a few of those above; but one half nearly of the upper story is separated for the reception of fever cases, and 2 small wards in the opposite half form a female Lock establishment.

The water-closets are said to be well drained; they are self-acting, entirely removed from the wards, but had an ill smell. There are baths on each floor, and patients who can bear it are bathed on admission. The water supply is good.

The wards are washed once a week, and swept out every morning. The entire hospital is emptied and whitewashed once a year. The ventilation does not appear to be very perfect, and the wards were certainly close at the time of our visit.

The bedsteads are of iron, and some have posts and curtains. The mattresses are of straw. After fever and other bad cases they are purified or destroyed.

There are seven nurses, one to the fever wards and two to each of the other three half-floors. There are three under nurses, who alternately perform the night duties. The staff consists of three physicians, three surgeons, a house surgeon, and an assistant house surgeon.

As regards treatment, it seems that, with the exception of occasional leeching and cupping, bleeding and depleting measures generally are rarely employed. Stimulants are not given to excess. Water dressing is generally employed in the treatment of wounds.

Cases allowing of no delay may be admitted by the house surgeon, but all others must have a governor's recommendation, and apply on the weekly admission day. Fever cases (excepting small-pox) are admitted into the fever wards on payment of 1*s.* per day, and domestic servants in place are admitted into the hospital on the same condition. Eight female venereal patients are allowed to be in the Lock wards, but no male with primary syphilis is admitted. Incurable cases, cases in a dying condition, persons suffering from habitual ulcers, women advanced in pregnancy, and children under seven (except for operation) are excluded. Applicants come equally from the town and the

surrounding country." Fever cases are occasionally brought in a sedan-chair belonging to the hospital.

The hospital contains 125 beds, of which about 65 (including 32 fever beds) are medical and about 60 (including 8 for female syphilitics) are surgical; 71 are for men and 54 for women.

At the time of visit there were 75 patients in the house, of whom 51 were men, 24 women, and of whom 38 were suffering from medical affections and 37 from surgical affections. The Lock wards were empty, and the fever wards contained only 2 cases of typhoid, but were occupied by ordinary medical and surgical cases.

Of the medical cases, 2 were acute, but not serious, 7 were acute, and of a nature liable to lead to fatal results, viz., 2 of typhoid, 1 of pneumonia, 1 of pleurisy, 2 of acute rheumatism with heart disease, and 1 of nephritis; the remaining 29 were chronic, but also included 11 severe cases, of which 5 were cases of phthisis.

Of the surgical cases, 7 were acute, 17 were the result of accident, and 13 were chronic. Among them were 13 cases of open wound, 4 of simple fracture, 4 of compound fracture, 2 burns, and 2 cases that had been operated upon, including an amputation for the results of a burn. A slight erysipelatous blush had attacked one wound.

The number of patients in the house varies from 74 to 80.

During the year ending 25th March 1869, 758 patients were admitted, of whom 35 (or 4·6 per cent.) died. And in the succeeding year the admissions were 753, and the deaths 37 (or 4·9 per cent). Of the number for the latter year, 40 (including 36 cases of fever, 2 of measles, 1 of scarlet fever, and 1 of variola), with 2 deaths and a mortality of 5 per cent. were admitted into the fever wards. 9 cases only of primary syphilis and 4 of gonorrhœa were received. As regards medical cases, there appears to be nothing particular to observe. They comprise many cases of bronchitis, of chronic rheumatism, of phthisis, of chronic heart disease, and of dyspepsia. The surgical cases comprise 143 casualties, among which were 11 burns and scalds, and (excluding accidents to toes and fingers) 37 simple fractures and 8 compound fractures, 4 cases of concussion of the brain, and a gunshot wound. The deaths are chiefly due to medical causes, and occur chiefly among medical patients; 25 occurred among medical and 12 among surgical cases. Of the former, 3 were due to phthisis, 3 to dropsy, 3 to bronchitis, 2 to heart and 4 to renal disease. Of the surgical, 10 were the results of accidents.

No record of operations is preserved; they are stated generally to do well; and it is asserted that erysipelas, pyæmia, and sloughing (originating in the house) are rare. Operations, however, are probably infrequent.

The health of officials is said to be generally good, but since our visit the house surgeon and a porter have died of fever, caught, very possibly, from patients in the fever wards.

The hospital must certainly be regarded as a purely country hospital. The building is an old one, and has many defects of construction and of arrangement; and indeed some of the improvements (such as removal of water-closets and so on have been attended with counterbalancing inconveniences, such as interference with the means of ventilation. The hospital admits both fever cases and cases of syphilis in women; but fever cases are expected to pay, and probably on this account are few in the course of the year; and female syphilitics have to obtain a governor's letter, which tends practically to exclude them.

The records of cases unfortunately teach little. The most interesting fact concerning the hospital is given in the following note furnished to us by Dr. Peacock, who some years ago was house surgeon to the Hospital. He says:—"During the first "two and a half or three years that I was at the Chester Infirmary we had only "occasionally serious accidents and injuries under treatment, and the wards were "never overcrowded, and we never found erysipelas or any other unhealthy complaint "occur in the cases treated. During the last 12 or 18 months, however, the Chester and "Crewe and Chester and Birkenhead Railways were in course of construction, many "serious accidents were admitted into the infirmary, and the wards employed for their "reception were often overcrowded. Under these circumstances the wards became very "unhealthy, erysipelas constantly occurred, and the wards required to be closed, white-"washed, and thoroughly cleansed before they could be again employed. I may add, "that the whole place was whitewashed and cleansed every year, and that a more healthy "site could scarcely be found in any town."

J. S. B. T. H.

CHICHESTER.

THE CHICHESTER INFIRMARY is a modern hospital dating from 1824, with the exception of a small addition made in the year 1839. It consists of a simple block of building, with basement and two stories, of which the upper one only is ordinarily used for wards, though there are also two wards, and two chambers for one bed each in the ground floor. It is placed almost outside the town, and has a large space of ground (about two acres) around it. It is therefore as pure an example of a country hospital as can be found. The cases are almost all of a chronic nature, except the accidents, which are not numerous. The letter system, with weekly admission, is enforced; and there is an out-patient department, which undertakes the visiting of patients at their own houses*, and this also no doubt contributes to keep acute cases out of the hospital. By rule, however, scarlet fever and small-pox are the only acute diseases excluded. It is directed (Rule 71.) that persons labouring under fever or other acute diseases may be received at any time by the direction of the physician of the week; but the following rule (72) directs that the

* At the time of our visit the house surgeon was labouring under small-pox, contracted in the discharge of this duty.

CHICHESTER.

same class of persons ("attacked with sudden or violent illness") shall be seen at their own houses by the physician, surgeon, or house surgeon, and it seems that they prefer to avail themselves of the latter provision. Consequently the hospital appears to be seldom, if ever, full, the average being between 40 and 45 beds occupied, whilst about 80 beds could be made up in cases of emergency, and most of the cases are convalescents, able to leave their beds.

It is perhaps well that the infirmary is thus restricted to the cure of the less acute forms of disease, for it is hardly so constructed as to be very available for the treatment of acute cases. The back of the hospital (north side) is occupied by a corridor, and the wards are placed between this corridor and the south front. They have therefore no thorough ventilation, nor are they provided with much window space, being little more than large chambers full of beds. The beds are put on all sides of the wards, and very close together, in many cases nearly touching each other. The cubic space appears to be small, and would be still more restricted but for the rather disproportionate height of the wards. The corridor, however, has the advantage of allowing the water-closets to be placed on its further side, entirely out of the way of the wards, and also outside of the walls of the building. The importance of this latter arrangment is obvious, when it is recollected that the drainage of both hospital and town is bad. The water-closets of the hospital are drained into two large cesspools on the north side of the building, from which drains run to carry off the surface water, the soil being left to accumulate till it is necessary to empty this cesspool. These drains originally ran just outside of the building; but when in 1839 the addition (Dixon wing) was made to the east end of the building the drains were thus brought under the walls of the hospital. The matron, who was at that time lodged in rooms at the east end of the basement floor, was attacked by erysipelas, and severe fever also broke out in the house. The course of the drains having been altered this subsided.

There is a day nurse and a night nurse for each side of the house. These nurses live in the hospital. Extra nurses are hired when wanted. The wards are scrubbed by women, who are hired for that purpose out of the town.

At the time of visit, besides the wards on the ground floor, which are only occupied in case of emergency, one of the female wards on the upper floor was emptied on account of fever having prevailed in it. The house contained 38 patients; 13 females, 25 males; 12 of the patients were medical. This large preponderance of surgical cases seems, however, to be accidental, since in the last published report exactly half the cases are classed as medical. Out of 352 cases*, 176 were medical, 136 surgical, and 40 casualties. With respect to the results of practice, secondary affections are not very common, as is natural, having regard to the class of cases treated; but none of the usual forms of hospital affections are unknown. Erysipelas occasionally breaks out, and will sometimes extend to other patients in the ward, especially cases of operations. When a case of erysipelas is severe, or when the ward in which it shows itself contains cases which render its spread probable, the case is transferred to one of the single-bedded chambers with which the house abounds. Phagedæna also sometimes occurs. Pyæmia appears to be proportionally common. Thus, of 20 cases which died in the year, Oct. 1862-63, one patient after amputation of the thigh died with symptoms of severe cold and dyspnœa. No post-mortem examination was made, but it can hardly be doubted that this was a case of pyæmia. Another, a young woman, died after ligature of piles, with abscess in the liver. Of the remaining 18 deaths, 10 appear to have been due to chronic visceral disease, 3 to the direct result of accident, 3 to acute (medical) affections, 1 to acute surgical affection, and in 1 the cause of death is not given. The admissions in three years were 920, and the deaths 46, precisely 5 per cent.

Surgical operations are not very numerous, but amputations are reported to do well in almost all cases, except when performed for severe injuries.

In estimating from the hospital register the period of stay of simple fractures of the thigh and leg (excluding patients on each extreme of life) we found the average of 10 cases of the fracture of thigh to be 63 days, and of 20 cases of fracture of the leg 45 days. It would hardly be said that these patients had been detained relatively longer than they would have been in metropolitan or other crowded hospitals, since we noticed that many of them were re-admitted on account of the same injury. In forming the above average such re-admissions were not computed T. H.

COLCHESTER.

THE ESSEX AND COLCHESTER GENERAL HOSPITAL is the hospital for a large part of Essex. It stands to the west of the town of Colchester, on the London-road, at a high level, and on a gravelly soil. It has extensive grounds attached to it, to a considerable portion of which patients have access at certain hours.

The hospital itself is a substantial commodious-looking building, of symmetrical form, and two floors. The central part of the building on the ground floor contains the entrance hall, board room, physicians' room, kitchens, and other offices; the wards are situated on either side. On the upper floor there are wards occupying the same position as those on the ground floor, but there are also three small wards and an operating theatre placed between them.

The hospital contains 7 wards, 4 large, with 20 beds apiece, and 3 small, with 3 or 4 beds each. The large wards are placed symmetrically on the ground and first floors at

* It should be noted that this total includes re-admissions, so that the number of separate individuals treated in the hospital is less.

the sides of the building. Each of these wards is formed really of two wards, placed at right angles, and communicating by a door of considerable dimensions. Those on the ground floor are 13 feet high, and allow a cubic space of about 950 feet to each bed; those on the upper floor are 12 feet high, and allow a cubic space per bed of about 860 feet. The windows are somewhat irregularly placed, and are rather few in proportion to the size of the wards. They open in the usual way by sashes. Ventilation is effected almost entirely by windows, aided by doors and open fire-places. There are ventilators in the ceilings of the upper wards, but they have been found of little or no practical utility. The small wards, which are operation wards, have only a single window each. No artificial system of heating or ventilation is employed. At the time of our visit the wards appeared to be clean, sweet, and well ventilated. The floors are scrubbed frequently, the walls are whitewashed, and the hospital is thoroughly cleansed once annually. The bedsteads are of iron. All have curtains at the head; but one in each ward has four posts, and curtains all round, and is intended for the reception of eye cases. The mattresses are filled with oat husks, and are frequently emptied and cleansed. There is a water-closet to each of the large wards,—clean, well ventilated, well drained, and separated from the ward by a lavatory. There is one bath-room, but patients are not bathed on admission, except when dirty. Water is both laid on and supplied by a well; the supply is abundant and good.

Five nurses constitute the full complement, viz., one to each large ward, and one when necessary to the operating wards. These live and board in the house. A night nurse is hired when requisite. There are three surgeons and one physician, who attend twice a week to see in and out patients. There is also a resident house surgeon.

The out-patients are seen and the house surgeon sleeps in a detached building.

The regular medicines are made up by a dispenser, who attends twice a week.

In the treatment of patients stimulants are freely used, but depletion very rarely. During the last five and a half years three cases of injury to the head have been bled. Poultices, but more frequently water dressing, are used in surgical cases, and tow and cotton wool alone are employed in the cleansing of wounds.

Patients are admitted by letter once a week. Accidents and emergencies are received without recommendations at any time; but practically nearly all patients are admitted by letter. The applicants are chiefly the labouring population of the town and of the surrounding country. No children under 7 years of age (except in special cases), or women big with child, no case of insanity or epilepsy, no fever or other infectious case, no one suffering from the venereal disease, and no one supposed to be incurable, or in whom death is impending, is admitted into the hospital. Phthisical cases are occasionally received. Medical and surgical cases are mixed together; the only separation that takes place is that of operation cases.

The hospital contains 90 beds, of which 46 are male and 44 female; but they are never full. The average daily number in the house, calculated for a considerable number of years, was 50, but during the last year it was only 45. It is obvious, therefore, that the cubic space allowed to each patient is much larger than that allowed to each bed, and that means of ventilation, which might prove inadequate if wards were much crowded, may, under existing circumstances, be ample, as they seemed to us to be. The average stay of patients in the hospital was, in 1862, 63 days.

At the time of our visit there were 31 patients in the house; 16 male and 15 female; 6 medical and 25 surgical. The only acute medical case was one that by rule should have been excluded, namely, a case of scarlet fever, which was placed by itself in one of the operation wards. Of the surgical cases, 1 was a crushed hand, 1 a gunpowder wound of the hand, 1 a fractured leg, 1 a wound of the leg, and 1 a case of calculus vesicæ; the others consisted of either strumous joints, affections of the eye, or comparatively trivial ailments.

On examining the hospital records we find that the per-centage of deaths from the opening of the hospital in 1820, up to the present time, is 4·5; and further, that 262 cases were admitted during the year 1862, and that 8 (or 3·0 per cent.) died. The only acute medical cases admitting of treatment taken in during the year were, a case of tonsillitis, 1 of diarrhœa, and 1 of rheumatism. With the exception of accidents, which were 35 in number, the surgical cases were almost wholly chronic or unimportant. Of the 8 deaths which occurred in the year, 2 were from serious injuries, 1 from diseased thigh, 1 from apoplexy, 2 from cancer, and 2 from phthisis. 10 capital operations were performed; 4 of which, all cases of amputation of the leg, were attacked with phagedæna, but recovered. In 1861 there were 8 deaths, of which 1 was due to burn, 1 to injury to the belly, and 1 to apoplexy; all the rest being due to chronic disorders. In 1860 there were 19 deaths, 1 from burn, 1 from crushed foot, 1 from compound fracture of the leg, 1 after the operation for hernia, and 1 after that of lithotomy. There was a death too from acute rheumatism, 1 from peritonitis, and 1 from purpura. The following is the list of operations (of the class selected for comparison) for the years 1859, 1860, 1861, and 1862:—

		deaths.
Amputation of thigh	2	0
„ leg	10	2
„ arm	3	0
Lithotomy	3	1
Herniotomy	3	1

This may be taken as the very type of a country hospital; the persons admitted are almost exclusively agricultural labourers; all cases in which there is a suspicion of con-

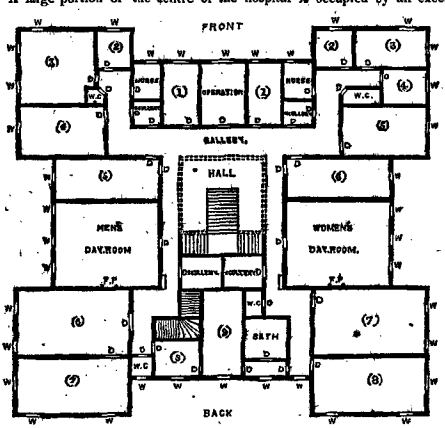
tagiousness are carefully excluded; and, with the exception of a comparatively small number of accidents or other cases of emergency, both surgical and medical cases are of an unimportant and trivial or chronic nature, such as would generally be excluded from a London hospital, or retained therein for a very short time. Further, cases which threaten to be soon fatal are refused admission, and even (in a large proportion of cases) patients about to die are removed by their friends. Again the average stay in the hospital is unusually long. It is obvious, therefore, that the death rate of the hospital cannot be taken in any degree as a test of the salubrity of the hospital. Again, as few accidents or cases requiring operation are admitted, and as operations are necessarily, therefore, infrequent, traumatic atmosphere must exist here in its most diluted form, yet erysipelas now and then shows itself, and phagedæna last year attacked four amputations in succession. Pyæmia is doubtless extremely rare; but post mortem examinations are scarcely ever made. A fatal case of typhoid is said to have originated in the hospital two or three years ago, in a case admitted for synovitis of the knee.

J. S. B.

DERBYSHIRE GENERAL INFIRMARY.—This hospital is situated within the town of Derby, and on comparatively elevated ground. It is surrounded by about 12 acres of grass land belonging to the hospital; and in the rear there is an airing-ground for patients, about an acre in extent.

The institution consists of two buildings, one the general hospital, the other combining a Lock and a fever hospital. The two buildings are separated from one another by a short interval, but communicate by an underground passage.

The general hospital is a handsome square building, with three floors, including basement. A large portion of the centre of the hospital is occupied by an exceedingly



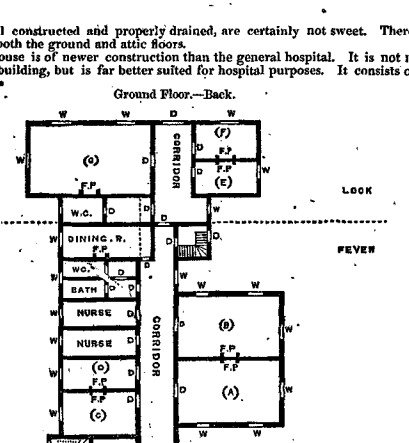
DERBY INFIRMARY.—Attic Floor.

fine hall, with staircases and landings, which extends from the ground floor to the roof, where it is closed in by a skylight. The wards and other rooms are situated around this hall, between it and the external walls of the building. The hospital contains 23 wards, two in the basement, four on the ground floor, and on the attic floor 17, together with two day-rooms (one for men and one for women). The wards vary very much in size and shape, but are all small, containing from seven beds to one bed apiece. Many are very low; but the ceiling has been raised in some, and is being raised in others. The beds are close, often touching, and the cubic space allowed to each is evidently very small. The greater number of the wards have one or two windows only on one side; two or three, however, at the corners of the building, have windows on two adjoining sides. The window space, however, is, as a rule, small in proportion to the size of the wards. The interior of the hospital has been most ingeniously frittered away in the formation of narrow, ill-ventilated, intricate passages and lobbies; the size of the wards and the ward-space has been thus necessarily curtailed, and the ventilation much interfered with. The wards in the basement are approached only by a kind of ladder, through a species of trap-door in the floor of one of the wards above. The water-closets seem, with curious infelicity, to have been squeezed into the most objectionable nooks, to have little ventilation, except what they get from the corridors, and although probably in

themselves well constructed and properly drained, are certainly not sweet. There is a bath-room on both the ground and attic floors.

The fever house is of newer construction than the general hospital. It is not nearly so imposing a building, but is far better suited for hospital purposes. It consists of two

Ground Floor.—Back.



Entrance.

DERBY INFIRMARY.—Front.

floors, which exactly resemble one another. The internal arrangements are somewhat irregular; but essentially each floor of the building consists of a corridor, with wards somewhat irregularly distributed on either side of it. The portion of the building intended for infectious cases presents two comparatively large wards on each floor, with five beds apiece; and two small wards on each floor, with one and two beds each respectively. The portion set apart for syphilitic patients is divided completely from the former, and comprises six wards, three on each floor; two large ones for eight beds each, and four small ones for one and two beds each respectively. The wards in this building are lofty and well ventilated; the larger ones having windows on two sides. The water-closets are entirely unexceptionable, and there is a bath-room on each floor.

Ventilation.—The windows throughout the entire hospital are ordinary sash windows, and present in many cases at the upper part a perforated zinc screen. But there is also a special apparatus for the ventilation of the hospital. About 50 yards in the rear of the main building there is a large tower, with a cowl, for the admission of fresh air from without. The air passes thence through a subterranean tunnel to the basement floor of the general hospital, where it is received into a large chamber heated by coils of steam pipes. From this chamber the air is carried by a flue to the attic floor, and is thence distributed to the various wards on that floor. Each ward is provided with a single grating (18 inches by six), just above the floor, through which the warmed air is admitted. In order to carry off the vitiated air, there are in some wards ventilators in the higher part of the wall, leading to a central flue, which is heated with steam-pipes, for the purpose of creating a draught; but in the wards which have been elevated the ventilators are in the ceiling, and communicate directly with the outer air. There are no fire-places in the wards thus ventilated, and for the purpose of adding to the temperature these wards are provided with hot-air pipes, which encircle their lower part. On the basement and ground floors there is neither artificial ventilation nor artificial heating. The fever hospital is artificially ventilated on the same principle, as has been described, but hot-water pipes are used instead of steam pipes; and the wards have open fire-places in addition.

The wards appeared clean; their walls are painted half way up, and whitewashed above. The floors are scrubbed once a week by the nurses; and every three years the hospital is painted, cleansed, and whitewashed throughout. The bedsteads are of iron, with posts and curtains in the general part, but without these accessories in the fever house. The mattresses are chiefly filled with oat-chaff, and are frequently emptied. Horsehair mattresses are used for fractures. Patients are bathed, as a rule, on admission. There is an abundant and good water supply.

There are five day and two night nurses in the general hospital, and a day and a night nurse in the other building. All live on the premises. The staff consists of two physicians and three surgeons, who attend in the morning; and of a resident house surgeon and assistant. Stimulants are largely employed in the treatment of patients; depletion rarely, if ever. Water dressing is the ordinary application to wounds, and both sponges and tow are used in their cleansing.

Accidents are admitted at all hours without recommendation; cases of contagious fever need a medical certificate only. Other urgent cases, though admissible at any hour, must have a governor's recommendation and a medical certificate. All other persons are admitted by governors' letters only, and on one day in the week. The cases which are excluded are women who have passed the sixth month of pregnancy, children under seven (except in special cases), persons with itch, insanity, or any incurable disorder. Domestic servants have to be paid for. Applicants for admission consist chiefly of labourers (both of the town and country in pretty nearly equal proportions). Syphilitic and fever cases are separated; but otherwise medical and surgical cases are intermixed. A carriage is kept at the infirmary for the conveyance of fever cases.

The hospital contains 147 beds (88 male, 56 female, and 3 used indifferently for either sex), of which 95 belong to the general hospital, and contain ordinary medical and surgical cases; 30 belonging to the fever house, and 22 to the Lock wards.

At the time of visit the hospital contained 86 patients, of whom 51 were males, 35 females; and of whom 35 (including 5 fever cases) were medical, and 51 (including 11 cases of the venereal disease) were surgical.

Of the fever cases, 4 were cases of typhoid fever, and 1 was a case of small-pox. Of the other medical cases, only 1 (a case of acute rheumatism) was acute, and 12 were cases of phthisis. Of the 40 non-venereal surgical cases in the house, 3 were acute, 24 were cases of accident, and the rest were chronic cases. There were 10 open wounds, 2 cases of fractured spine, one amputation above the knee, and one below the knee, both for disease, and a partial amputation of the hand for injury.

On examining the records of the hospital, we found that in the three years ending September 29th, 1863, the number of cases admitted was 930, 960, and 906 respectively, and that the deaths and death-rates in the same order were 37, 53, and 47; 3·9, 5·5, and 5·18. The total number of cases, therefore, for the three years was 2796, and of deaths 137. Of the number admitted, 121 were admitted into the fever wards, 253 into the Lock wards; 54 were admitted as cases of emergency, and 419 as accident cases. More than two-thirds of the cases seem to have been admitted by governors' letters. Looking to the causes of death in the 137 cases given above, it would seem that 36 of them (including 25 deaths from accidents and their results) occurred in surgical cases and 101 (comprising 21 deaths from fever, and 30 from phthisis) occurred in medical cases. Doubtless it would not be strictly accurate, and yet it would scarcely be very wide of the truth, to assume that the 25 deaths from accidental causes occurred among the 419 admissions for accidents (giving a mortality of 5·9 per cent.); and that the 21 deaths from fever were deaths of patients (of whom there were 121) admitted into the fever wards, in which case the fever mortality per cent. would be 17·3. If these deaths be subtracted from the total, and if further, the 30 deaths due to phthisis be subtracted also (which is literally done in some county hospitals, by habitually discharging consumptive cases when they seem likely to be fatal), this hospital would present a close resemblance to some of those institutions where neither serious accidents nor infectious diseases are admitted, and where patients likely to die are regularly excluded; and the per-centage mortality, as in such cases, would be exceedingly small; it would amount to 2·7 only.

During three years the following capital operations of the selected classes were performed:—12 amputations of the thigh, 3 for accident, with 1 death, and 9 for disease, with 1 death; 6 amputations of the leg, 1 for accident; 3 amputations of the upper arm, 1 for accident; a primary amputation of the lower arm; 2 amputations at the ankle for disease; 2 resections of the knee; and 2 stone cases, all successful; 4 operations for strangulated hernia, in 2 of which death supervened.

Secondary diseases are said to be very uncommon. Small-pox spread sometime since among a few patients.

The medical men and others complain seriously of the artificial warming and ventilation; but give no tangible proof of any injurious effect resulting therefrom. They object to the small wards, because the nurses, each of whom has to take charge of several wards, are unable to keep a proper watch over the patients, and at the same time find a convenient excuse for being out of the way when they are required. Further, they object to the central hall, because (among other things) it causes the diffusion of noises all over the building. Most of these remarks do not at all apply to the fever and Lock wards. There is little doubt that, with the exception of accidents and fever cases, those who come into the hospital are suffering chiefly from chronic diseases.

J. S. B. T. H.

DEVONPORT.

DEVONPORT HOSPITAL.—The Royal Albert Hospital just erected at Devonport is a small institution, much resembling St. Bartholomew's Hospital, Chatham; that is to say, consisting of a female syphilitic part, supported by Government, and a general hospital, built and supported by private charity. These two parts are separated from each other, and form opposite wings on either side of a large central staircase. There are two main wards in each of these parts of the hospital, besides several smaller wards in the general hospital and two separation wards in the Lock hospital. The general arrangement of the main wards much resembles that adopted at Bury St. Edmund's; in fact, the plan of one of

the wards at that hospital (see p. 627) may be taken to represent one of those at Devonport, with the exception that the lobby between the bath-room and water-closets which is found at Bury St. Edmund's is made into a part of the ward at Devonport (and forms a very agreeable recess with a large window), and that the fire-places are in the centre of the wards, and have an air-chamber surrounding each, and communicating with the outer air and with the wards, from which warmed air is intended to pass into the wards.

There is also a small accident ward on the basement, which is not below the ground, as the hospital is built on the side of a steep hill; so that both the wards on the ground floor and the accident ward and domestic offices on the basement are approached directly from the ground.

The natural ventilation and warming is to be alone used, and seems efficient.

The hospital is in an elevated situation, and the windows in the recesses above spoken of command extensive and beautiful prospects.

T. H.

DOVER.

DOVER.—The smallest country hospitals are those of which an example may be seen at Dover, where a large roomy house, with a garden of about half an acre, has been made into a hospital with 14 beds. But in such hospitals there is little instruction for our present purpose, seeing that the number of acute cases or of grave operations is so very small that no trustworthy amount of experience as to the success of the treatment of such cases is attainable in any reasonable length of time, nor could the practice be fairly compared with that of a hospital filled with acute cases, for the number of patients usually in hospital (11), and of their necessary attendants, is not greater than that of many private families who occupy similar houses, nor are most of the inmates confined to bed or even to their room.

For these reasons we did not think it necessary to make any remarks on these smaller hospitals, or dispensaries with beds, although we have visited several, as Hemel Hempstead, Dorking, &c.

The rules for admission at this hospital are the same as those of larger institutions, viz., weekly admission by letter, and it is probably to this circumstance that the almost entire exclusion of cases of acute disease is due. That such cases are so excluded may, we think, be considered proved from the facts that out of 72 cases admitted in the year 1862 there were only 11 which, judging even from the names of the affections, could have been at all urgent, and that none of these proved fatal. Surgical injuries were some of them of a severe kind, and the only deaths that occurred in the hospital during the year (three in number) were due to the direct effects of violence. At the time of our visit none of the cases were acute. No grave operations had been performed during the year.

Under such circumstances hospital affections would hardly be likely to be met with; but we learnt that slight cases of erysipelas were not unknown. Pyæmia had not been met with, at any rate of late, but then the cases which lead to pyæmia in our hospitals were extremely rare; and it seemed likely that post mortem examinations were still more rare.

T. H.

EXETER.

THE DEVON AND EXETER HOSPITAL is one of the most celebrated and one of the largest of our English country hospitals. It furnished for some time the only, and still furnishes the principal, hospital accommodation for a large extent of country. Patients still come from all parts of the west to this hospital. It is situated in the city of Exeter, having moderate sized airing grounds behind, and not closely crowded by the neighbouring buildings. Its rules are like those of most of the country hospitals. Patients are admitted by the weekly board on producing governors' letters; and it is ordered that eight beds shall be reserved at each board-day for accidents. Persons labouring under infectious diseases are excluded; and under the head of "infectious diseases" all fevers are held to be comprised. The number of patients admitted as accidents* in the year 1862 was 435, out of a total of 1354; and the same proportion (roughly speaking, about one fourth,) appears to have been maintained for several years. The effect of these circumstances and regulations is marked in the same way here as elsewhere on the population of the hospital. There are many interesting surgical cases and a fair number of operations, but the medical cases are almost exclusively chronic or trivial. Hence a very low rate of mortality, the average being apparently below 4 per cent. The pressure on the hospital accommodation seems slight, the average number in the house being stated at 185, and the number of patients admitted during the year 1862-3 giving only about six patients to each bed in the hospital, or 7·3 to each bed occupied.

The hospital is somewhat irregular in construction, having been built at different periods as extension seemed necessary. It consists, as will be seen by the annexed plan, of a main building or front, and a wing standing back at right angles to the main building. This is a recent addition. The main building, again, consists of two parts, one having a corridor and a number of small wards, the other having two wards on the block principle opening out of each other; to the further of these two wards the new wing has been joined. The latter part of the hospital was opened in 1858. We quote from the description published by the hospital authorities, which explains both the construction of the wards and their ventilation.

* It appears that until a year or two ago no medical cases were admitted without letter. This regulation has since been relaxed, but its effect in discouraging the application of urgent cases is doubtless still felt.

"The new wing consists of a basement story intended to be used as offices, above which are three stories containing the wards; and there is also a small ward and some rooms in the roof. Each of the three stories has two wards, side by side, or rather a double ward, one part of which is 80 feet long and 20 feet wide, and the other 70 feet long by the same width; the difference in length being occasioned by a room being taken off from one part for the nurse in charge. The clear height of each story is about 15 feet*, and every endeavour has been made to render the wards cheerful and airy. With this object the windows at the sides are numerous, and placed at such intervals that no bed will stand under a window.† There are also large windows at the ends, affording a pleasant view of the country; and in order further to promote ventilation, and obtain a good circulation of air, the wall dividing the adjoining wards is perforated by windows; and although a thorough draft will thereby be attained, means are taken to prevent its blowing down on the patients by an arrangement of the sashes, which are made to fall or incline on one side instead of sliding up and down in the usual manner. The upper part of the external windows is similarly arranged, and air may be admitted directly from the external atmosphere without injury to the patients whenever its temperature will admit of it.

"This mode of ventilation, combined with that of open fire-places, of which there is one in each ward, is considered by some medical authorities to be sufficient for all general purposes; but as generally a disinclination among nurses as well as among patients to keep open the windows at night or in severe weather, and as an equable and uniform temperature is desirable in most instances, and is almost imperatively required in severe medical cases, the committee, under the advice of their officers, determined to adopt other means of ensuring an abundant supply of fresh air, and, as far as practicable, an even temperature. The apparatus is intended for use both in summer and winter, the fresh air in the latter season being warmed by passing through vessels and along pipes, which are entirely heated by water, avoiding thereby all danger of fire and any loss of oxygen. The air is drawn directly from the external atmosphere, and is conducted by flues to the different wards, where it is diffused by passing through a perforated skirting of iron running the whole length of each. On the opposite side are gratings, both at the level of the floor and immediately under the ceiling; and, by means of the valves, the vitiated air can be drawn either from the top or bottom of the wards at pleasure, and conveyed by tubes in the roof to the ventilating tower, which forms a conspicuous part of the building. Smoke flues from the apparatus and other parts of the building open into this tower, and by their warmth materially aid in extracting the foul air from the wards; but as these flues will be little used in summer and during the night, when, from the windows being generally closed, ventilation is most needed, the architect has arranged the hot-water service, which will be mentioned hereafter, in such a manner that there will always be a large heating surface within the tower, and it is hoped that the expense of using gas or fuel for generating heat will thereby be saved. It should be mentioned that the supply of fresh air and of heat will be quite under control, as a certain amount of air will at all times be admitted into the wards, but it can be increased by means of valves at pleasure, and its temperature in winter can be regulated by passing it wholly or partially through the warming apparatus.

"Attached to each double ward is a scullery, with hot and cold water laid on; and also a large bath-room fitted up with warm, shower, and douche baths, and also with washing bowls. The supply of cold water is derived from two large cast-iron tanks at the top of the building, so arranged that one or both may be used, and repairs or cleansing effected without any stoppage of the supply; and the hot water service is effected by means of a circulation of water heated by two cylindrical wrought-iron boilers in the basement, and passing up into a large iron cistern in the ventilating tower; branch pipes lead to the several baths, sinks, &c., and hot water will be obtained at all hours of the day and night. The object of having two boilers is, that they may be used either singly or in duplicate, and that repairs may be made in one while the other is in operation.

"The latrines or closets attached to each ward are arranged so as to prevent, as far as practicable, all effluvium. They do not open directly from the wards, but a lobby is interposed. The doors are all made to close by means of balance weights, and they are made to act upon the water valves, so that every time a door is opened a rush of water follows; and besides this there is a ventilating flue from each closet, not opening into the main flues of the wards, but into a separate flue, which is conducted directly to the tower. A lift is placed in the staircase for raising food, coals, &c. from the basement to the several wards.

"In the construction of the building utility has been sought rather than ornament; indeed architectural display would be foreign to the great object of the charity, which is to effect the utmost amount of good, and to the greatest extent that the funds of the institution will allow of; and if the new wing is to be simply an addition to the old part of the hospital, embellishment would be quite out of place. The walls are built entirely of brickwork; the floors are made fire-proof; the staircase is of stone; and means have been taken, by the use of felt in the roof, to prevent changes of temperature being transmitted to the rooms below. Plain as the building is, it has a certain degree of grandeur from its proportions and loftiness, especially compared with the old hospital,

* This seems to give from 1300 to 1600 cubic feet of air per bed.
† This gives a clear space of about two yards between contiguous beds.

the wards of which are only a few inches more than 11 feet in height; and we think no one could go over it, and see the large, airy, cheerful wards, and the arrangements that are made for the comforts of the patients, without feeling that the money expended upon it has been judiciously laid out.

"Each of the three double wards will contain 30 beds, and the small ward in the roof will hold 8, making a total of 98; but the actual increase in the number of patients will be considerably less, inasmuch as several of the existing wards in the old part of the building will be appropriated to other purposes, and the crowded stated of the present wards will be put an end to whenever the new wing is occupied."

We have quoted this description at length because we believe it to bear forcibly upon two of the most interesting questions still mooted in hospital construction, viz., that of double wards and that of artificial ventilation. The experience of the officers of the hospital has realized the favourable expectations formed of these new wards. That double wards may be quite as healthy as single wards is proved, as we conceive, beyond the possibility of doubt, by the successful experience of more than a century at St. Bartholomew's. These wards at Exeter are an example of the same fact, though a less convincing one, on account of the few years they have been in use, and the less serious nature of the average run of the cases. But it will be observed that both have ample distance between their beds, and are freely and abundantly ventilated. As to the artificial ventilation and heating, it must be remembered that it is used as quite subsidiary to the natural means, and as such it seems to act well.

The drainage of the hospital was perfected at the same time that the wing was built. It is now believed to be very good; formerly it seems that some defects existed, as to the nature and effects of which we have no information.

The average stay of patients in the house is found to be 44½ days.

There is no school of pupils here. The hospital is served by four physicians and four surgeons. There are 15 regular resident nurses, who do no night duty, for which, as for any extra work, a variable number of nurses are hired. The treatment appears of much the same nature as in London. Depletion is so rare that only three cases of venesection could be recollected in as many years. Wounds are lightly and simply dressed. Sponges are used in the wards. The floors are scrubbed every week. The mattresses, which are of flock or of hair, are taken to pieces after every patient who has been in the house more than a day or two.

The number of deaths in one year (1861-2) was 50, of which one was unaccounted for. Out of the remaining 49, 24 were medical and 25 surgical cases. Out of the former 4 were caused by acute disease, 17 by visceral diseases (chiefly phthisis and cardiac affections), and 3 by other chronic diseases. Of the surgical, 6 were after injuries, 7 after surgical operations, 5 after acute and 7 after chronic diseases. The equality in number between the medical and surgical deaths, and the fact that almost all the former are the result of chronic and visceral disease, show the comparative unimportance of the medical practice. The death-rate in the year 1862-3 was 4·06 per cent.

Secondary hospital affections appear to be very rare here. We have been favoured with a complete list of the fatal cases of pyæmia which have occurred here since May 1861, verified by the names of the patients and the nature of the affections. The number is 12, and besides these there were symptoms of pyæmia in 2 others who recovered. Hospital gangrene has not been seen, except in one doubtful case, at any rate during three years. Erysipelas is not common, but has been known to spread in the ward. It seems to be hardly ever fatal. The hospital is regarded as being in general a healthy dwelling place. Scarlet fever has twice spread in the hospital during the last three years; and two inmates of the hospital were lately attacked with typhoid fever.

Surgical operations appear to succeed remarkably well here. We are unable to present a complete list, since, although a book is kept here for entering the operations and their results, it is only filled up by two out of the four surgeons, consequently the annexed list, which comprises all the cases of these operations which were entered in this book for three years, contains only about half the proper number of cases. But as it is an unselected, and, as far as appears, complete list for the practice of these two gentlemen, it may probably be taken to represent pretty accurately the experience of the hospital.*

	No.	Died.
Amputation of the thigh for disease	5	—
„ leg for injury	4	1
„ „ disease	6	1
„ arm for injury	1	—
„ „ disease	1	—
„ „ „ at shoulder	1	1
„ fore-arm for injury	1	—
Excision of the knee	9†	—
„ hip	2	—
„ elbow	1	—
Hernia	3	1
Lithotomy, children	2	—
„ adults	2	1

* In particular we were informed that no deaths had followed on excision of the knee, an operation often practised here.

† One was subsequently amputated.

This list, as far as it goes, shows a very low mortality; but it must be noticed that the operations were not numerous, and were most of them performed for chronic disease in country people of quiet and temperate habits. The success of the cases of excision of the knee, which is the most striking fact of this kind here, seems due also in great measure to careful selection of appropriate cases.

At the time of visit it appeared that there were 233 beds made up*, of which only 155 were occupied. Of these patients 43 were medical, of whom 3 were reckoned as suffering from acute disease; 112 were surgical, of which 29 were accidents, comprising 14 simple fractures, 1 compound fracture, and 1 burn; 16 were acute cases, among which were an amputation of the leg for disease, 2 primary amputations of the arm, 1 at the shoulder joint for disease, and one excision of the knee; the rest were chronic cases. There were no cases of erysipelatous or hospital diseases. The number of open wounds and sores was 46.

J. S. B. T. H.

GLOUCESTER.

GLOUCESTER INFIRMARY.—The Gloucester Infirmary is a complete specimen of a country hospital. It is well situated near the outskirts of the town, with a gentle slope down to the river, which runs close by; has a sufficient space for air and exercise of the patients, is moderately well constructed, and above all appears never to be crowded. The whole house consists of two parts; an old hospital, containing six large and three small wards, and a new part, containing three large wards; the two perfectly distinct, and only connected by a small corridor. This latter adjunct to the hospital looks as if it had been intended for a fever house, but, if so, it has not been found necessary to apply it to that purpose. It is now used as the medical part, while the old building is reserved for the surgical hospital.

The two buildings together contain 161 beds; but only 90 of these were in use at the time of visit (June 19), and the average of 1862 was 99; so that there appears always to be a great deal of spare room.† The letter system appears to be strictly adhered to, except in the case of soldiers and sailors, and of accidents. Out of 603 admissions in 1862, 145 were without recommendation on account of accident. The arrangements of the hospital are good. The old building consists of a body, in which are the offices, dwelling-rooms, and small wards; and a wing at each end, in each of which are three large wards over each other.* Each large ward contains 18 beds, rather more than it would be proper to put in the ward if the cases were more acute, since the cubic space per bed is only 1116 cubic feet, and although this would not be a very insufficient allowance if the beds were sufficiently separated, yet, as it is, the arrangements of the wards have compelled the beds to be placed too near together. Almost the whole of one side of the ward is taken up by the two fire-places and the door, and is consequently not available for beds, which have therefore to be placed very close together, two feet clear between each pair of beds being the maximum. In the new building this is not the case, the beds being further apart, inasmuch as the wards are wider and have only one fire-place.

As to the results of practice, out of 1689 patients admitted in the three years referred to, 83 died, a rate of 4·9 per cent. Taking the year 1862, in which there were 31 deaths, we find almost half of them due to chronic and incurable medical disease; phthisis, diseased kidneys and liver, diabetes, &c. 7 were the result of acute surgical disease or operation (in one case erysipelas after the excision of a tumour, and in another a doubtful case of pyæmia); 6 were the direct result of accident, 2 of malignant disease, and 2 of acute medical disease.

Of the operations selected for comparison a considerable number seem to be performed. Amputations are those which are most frequently practised, chiefly as it seems for disease. The list furnished to us for 1862 does not distinguish primary amputations from those performed on account of disease. The numbers were—5 amputations of the thigh, 5 of the leg, 1 of the arm, 3 of the fore-arm, 1 excision of the elbow, 1 of the knee, and 2 cases of strangulated hernia; of these only one of the cases of hernia seems to have died, although the case of excision of the knee was unsuccessful, and amputation had to be practised.

As to hospital complications, erysipelas is very rarely seen here, and does not spread in the hospital. Phagedæna appears almost unknown. Pyæmia is an occasional cause of death after injury or operation. At the time of visit there were 96 patients in the house; 22 were medical; and all were chronic cases or cases of phthisis; only two of these were keeping their beds; 68 were surgical; 18 accidents, including 7 simple fractures and 2 burns; 16 acute cases, including two amputations of the leg; and 34 chronic cases. There were two cases of erysipelas, one simple and one phlegmonous, in the wards, but neither had originated in the house.

T. H.

GUILDFORD.

THE SURREY COUNTY HOSPITAL, Guildford, of which the first stone was laid on the 31st July 1863, is being built upon the Hog's Back, an undulation of the chalk formation between Guildford and Farnham, and is placed at about 400 yards from the nearest buildings.

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* Inclusive of children's cots, which are probably not reckoned in the official summary.
† The average was, in 1860, 78; in 1861, 87; in 1862, 99; so that the numbers appear to be on the increase.

GUILDFORD.

The hospital at Aylesbury has been taken as a type upon which the Surrey County Hospital is to be constructed.

The general arrangement of the hospital consists of a central block, two wings extending east and west, and a building thrown backward towards the north, containing kitchen, scullery, larder, waiting-room, and servants' hall, but connected with the central block by means of a passage, having on either hand a lift and convenient domestic accessories. The central block is carried a story higher than the wings, and in the basement of this part of the building there is capacious cellarage and a pump-room. On the ground floor of the central block there is a large entrance hall, from which commences a spacious stone staircase ascending to the ward floor; the entire of this central block, except the entrance hall, consists of rooms appropriated to the accommodation of the officers and servants of the institution.

On the ground floor in either wing are rooms for the administration of the charity. Those in the east wing are appropriated to the service of out-patients, and to the apothecary's department; those in the west wing comprise store-rooms, one of which may be used by convalescents as a day-room, and a large room intended to be used as a board room and chapel. These rooms in the several wings communicate with each other and the central hall, by means of spacious corridors, taking the course of the north front of the building, from which they are lighted and ventilated by several large windows.

On the upper floor in either wing there are three wards, with nurses' rooms and sculleries. Two of these are intended for special cases—each accommodating two beds. The third is a large ward, 92 feet long, 26 feet wide, and 17 feet 6 inches high, containing 22 beds, with a breathing space to each, of more than 1,800 cubic feet. The walls and ceilings are constructed of Parian cement, stained with some neutral tint. The water-closets and lavatories, with bath-room, are placed in spaces projecting from the extreme angles of the building, and are so constructed as to prevent the entrance of effluvia into the wards, while they admit of convenient and ready access. On each side of these large wards there are five windows of plate glass, extending from about 30 inches above the floor to about 15 inches below the ceiling. At the extreme end of each of these large wards are three additional windows, the central one of which is so constructed as to permit of a patient, bed and all, being wheeled out upon a spacious balcony.

The ventilation of the wards is principally effected by the windows; but, there is a provision made for the escape of vitiated air near the ceilings by the side of the flues, and an arrangement for its being driven outward near the floors. Pure external air is also admitted through perforated tiles at the back of each fire-place. Passing through chambers in this situation it is warmed, and escapes into the wards through a revolving valve upon the level of the chimney piece.

The floor over the kitchen is approached by the stone staircase ascending from the central hall. It is divided into an operating theatre and a ward on each side, containing two beds for operation cases, with a nurse's room to each.

The upper floors are laid upon iron joists, and have six or seven inches of concrete run into the interspaces of the joists. The floors are thus rendered quite fire proof, and impervious to sound.

The main supply of water is obtained from a well about 100 feet deep; the quantity is inexhaustible. In regard of quality, it is very free from organic matters, but contains mineral and saline substances in solution, although not in large proportions.

In speaking of the wards it has been omitted to be stated that previous to the commencement of the building Lord Onslow made it a *sine qua non* that a floor of the best possible workmanship and material should be constructed above the ceilings of the two principal wards immediately beneath the roof. This floor, although perhaps superfluous, will afford an excellent promenade for convalescent and other patients in bad weather. In this respect it may be regarded as an acquisition. Small dormer windows have been constructed for the purpose of lighting this roof space.

The disposal of the drainage has constituted one of the main difficulties in the construction of the building. It happens that the town of Guildford is unprovided with any system of sewers, so that the sewage is almost exclusively discharged into cesspools. The drainage of the hospital has necessarily been disposed of in the same way.

A laundry and dead house, with a post-mortem room, are built upon an extreme point of the hospital grounds.

The ground has been given by Earl Onslow, and the total cost of the building is estimated at 12,000*l*.—(*Information derived from R. Eager, Esq.*)

T. H.

HEREFORD.

THE HEREFORD INFIRMARY is another of the class of country hospitals, properly so called. It is beautifully situated on the outskirts of the town, close to the river Wye. It was built about 80 years ago, and, like most country hospitals of that date, contains no large wards. The highest number of beds in any ward is 9. The town in which it is situated is small, containing about 16,000 inhabitants, and is in the midst of a large agricultural and woodland district. The neighbourhood does not seem to be in the highest possible condition of health: since in the country the damp from the extensive woods is thought to be the cause of the rheumatic affections which prevail to a great degree,

HEREFORD.

though this has been the case to a less extent since these woods have been somewhat cleared; and in the town the drainage has, until lately, been very bad, the soil having been carried into cesspools, which there was some reason to think communicated with the wells; but since the drainage has been improved, and waterworks have been provided, the health of the place has much improved. Rheumatic fever, chronic rheumatism, and scrofulous affections are the prevailing complaints. Scarlet fever, measles, and hooping-cough are also frequent. Ague is rare, as is typhoid fever.

The letter system seems strictly adhered to at this hospital, so that the acute cases appear to be almost limited to those of surgical accident. The recommendation of a subscriber appears to entitle its bearer to admission, unless there is something improper in the case. Cases of "infectious distemper" (under which head all fevers are probably intended to be included), of syphilis, itch, &c., are adjudged by rule to be improper cases for admission, and in cases of "habitual ulcer" it is directed that the patients shall not be admitted a third time.

There does not seem much pressure upon the resources of the charity, for out of the 90 beds in the hospital less than 70 are habitually occupied. The average numbers for the past three years were 63, 63, and 71. At the date of visit there were 74 patients in the house, 51 of whom were surgical. The medical cases were all chronic, with the exception of two, one of which was classed as acute rheumatism, and the other as acute nephritis. Of the surgical patients, 13 were accidents (4 simple, 2 compound fractures, —no burns), 8 acute and 30 chronic diseases. It may be noticed that there were no less than 7 amputations of the thigh, leg, arm, and forearm in the hospital at the time of visit, and all were doing well; 5 of these were primary, and in one (of the thigh) there was a compound fracture of the opposite leg. Amputations, as a rule, do very well here. From Lady-day 1861 to Lady-day 1863 15 amputations had been performed with only two deaths, 10 of them being primary.

Amputation of thigh	-	5	For injury	-	2	- 1 died.
			„ disease	-	3	- —
„ leg	-	3	„ injury	-	3	- —
„ arm	-	2	„ injury	-	2	- —
„ forearm	-	5	„ injury	-	3	- —
			„ disease	-	2	- 1 died.
		15	10 for injury	-		1 died.
			5 „ disease	-		1 died.

There had also been 9 cases of strangulated hernia, 4 of which died. The hospital is frequently visited by (or perhaps is seldom entirely free from) erysipelas in a mild form. One case occurring in the hospital was in the wards at the time of visit. Pyæmia also is not a very rare cause of death, as will be seen by the list of deaths given below. The prevalence of erysipelas, however, is believed to have been diminished by an improvement which has been recently effected in the drainage of the hospital. Formerly some regurgitation was allowed by the main drain having become obstructed, but now the drain is taken down more directly into the river, and is flushed with water every week. The rate of deaths was about 3·6 per cent. over three years; 1,661 admitted; 60 died. The following list of the deaths for two years will give an idea of the causes:—

Acute medical disease - - - 8.
Apoplexy 1, pneumonia 1, inflammation of brain 1.

Visceral disease - - - - 30.
Phthisis 13, disease of heart 9, disease of kidneys 7, aneurism of aorta 1.

Acute surgical disease and operation - 9.
Hernia 4, pyæmia 3, ovarian dropsy 1, caries of sacrum 1.

Chronic disease - - - - 4.
Paralysis 1, spinal disease 1, morbus coxæ 1, old age 1.

Cancer - 1.

To these must be added a certain number due to the direct results of violence. The number in three years was 10. We have no means of stating the precise number which occurred in the two years over which the above list extends.

As to the house, it is not built upon the principles which regulate the construction of hospitals at the present time, as there is no provision for the thorough ventilation of any part of it, except that the two new wards have windows on both sides; and the cubic space in almost all the wards is below (in some considerably) or very little above 1,000 cubic feet per bed. But then it must be remembered that the wards are seldom, if ever, full. There is no distinction between medical and surgical beds; and this is no doubt an advantage in a hospital of this nature, since it allows of the dilution, as it were, of the traumatic atmosphere of patients having suppurating wounds by others who are labouring under chronic ailments only, who are neither liable themselves to suffer from the contiguity of discharging surfaces, nor to infect those who are affected by wounds, and who, besides, are many of them out of bed, and therefore can relieve the ward of part of its population, during some part, at any rate, of each day.

With respect to the period of union of simple fractures, we have been favoured with information as to the stay in the house of 20 patients with simple fracture of the leg, the average being 38 days; and of 20 patients with simple fracture of the thigh, the average being 68 days.

T. H.

THE HUDDERSFIELD INFIRMARY is situated in a thriving manufacturing town where the inhabitants are well off, and live well. They are said to be of moderately temperate habits, and pretty healthy. The situation of the hospital itself is beautiful. When built (about 30 years ago) it was in the country; but the town has now grown up to it. It stands on high ground, overlooking the town, with a large garden in front and behind. The building is now in the form of the letter L; but the old hospital was merely a block of buildings with two equal ends [illegible]; the end of the long vertical limb being a subsequent addition. The chief of these new wards is the best in the house, having opposite windows and ample space. There is also an accident ward below this, and of much the same construction, but not so lofty. All the other wards, which are all on the first floor, are small, opening out of a corridor, and much resembling the rooms of a dwelling house. They are lofty, and if judged merely by the test of cubic feet per bed would appear sufficiently spacious, since in most of the wards there is an allowance of 1200-1400 feet per bed, allowing all the beds to be full. But if we come to look a little more closely into the matter we find that this would be deceptive. The small size of the wards prevents the beds from being properly separated from each other. They are very close together in most parts of the hospital, and in others they even touch each other; hence the wards are not well ventilated, and if full it seems that they become unhealthy. At such times, we were informed, that pyæmia seemed to show itself and to become rife. But here, as in so many of our hospitals, we have to regret the absence of distinct information from records compiled at the time. There is no doubt, however, that some objection is found to exist to maintaining the inmates of the hospital at their proper complement, and that this objection is connected with the prevalence of hospital disease; and we may very fairly conjecture that a different construction of the hospital would have placed it in more favourable circumstances. Otherwise there is nothing to account for any unhealthiness, or any prevalence of hospital maladies. The situation, as already noticed, is beautiful; the drainage goes down directly into a disused coalpit of great depth, through which a rapid stream of water is always rushing. There is an unlimited supply of water; the water-closets are on the other side of the corridor, removed from all the wards, and quite in a distant part of the house from some of them; and although they are not of a very perfect construction, their position is such that they cannot affect the wards. The new wards, which seem the healthiest in the house, have subsidiary heating by hot-water pipes, and subsidiary ventilation, by tubes in the floor, for entrance, and ventilating pipes in the ceiling for escape of air; but the air is said to enter through both. All these arrangements appear as good as the originally faulty construction of the building allows. Again, if we turn to the regulations of the hospital, we shall find that they are such as usually exist in our provincial hospitals, viz., weekly admission by governors' letters, and exclusion of infectious diseases, and that they have the usual effect in restricting the practice to the treatment of accidents and chronic cases.* The number of the former, and their severity, is very different now from what it was. Formerly, when the numerous railways which intersect this part of Yorkshire were in construction, severe accidents were of very frequent occurrence†; now the number of grave operations is small. But here, again, we have no information, either for late or early times, and can therefore give no estimate of the positive or comparative statistics of surgical operations here. We are justified, however, in saying, that the old hospital was severely affected by pyæmia, and that the disease depended apparently on overcrowding; that since the enlargement of the hospital the wards are rarely quite full, and that hospital diseases are infrequent. Erysipelas and phagedæna rarely, if ever, originate in the hospital, and have never spread from cases admitted; and there is little pyæmia. But it must be remembered that these are only general statements, and that the proportion of serious cases has changed in the interval.

One deduction, however, appears abundantly clear from the few facts we have gathered at this infirmary, viz., that the benefits of a country situation are not so great as to counterbalance even trifling faults in the construction of a hospital; and that small wards, with the consequent deficient ventilation of the house and its parts, and too close proximity of the beds, will be quite sufficient to induce hospital diseases, in spite of the advantages of good air, good site, good drainage, and even a sufficiency of cubic space; to which we believe we may add, a class of patients superior to those of large cities; for though the inmates of hospitals here are certainly an urban population, yet it seems to be the opinion of those who know them that these workers in the manufacturing districts are of as good constitution and bear injuries and diseases as well as any of the rural classes.

The death-rate is high. It should not be forgotten, however, that the number of admissions is given accurately, i.e., without counting in the re-admissions. In three

* The number of patients admitted for accident and injuries was 93, out of a total of 328, in the year 1862.

† One of the surgeons remembers to have performed 11 primary amputations in 12 days.

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years, 1860-62, 947 patients were admitted, and 94, or 10 per cent., died. We have been favoured with the following statement of the causes of death for the year 1862.

The number was 39, out of 328 admissions. Of these deaths, 16 occurred among physicians' and 23 among surgeons' patients. The causes are thus given:—

4 deaths are recorded from causes not stated; they were admitted for—

Angular curvature of the spine	1
Psoriasis	1
Bronchitis	1
Severe laceration and contusion of foot	1
Compound fractures and dislocations—	
Railway accidents	3
Machinery ditto	5
Ordinary ditto	2
Burns and scalds	3
Strangulated hernia	1
Peritonitis, Chronic	1
Injury by a cart shaft	1
Psoas abscess	2
Erysipelas following—	
Injury to the eye	1
Do. to the foot	1
Concussion of the brain	1
Epithelioma	1
Phthisis	3
Heart disease	3
Typhoid fever	1
Disease of the liver	1
Tabes mesenterica	1
Bronchitis	1
Apoplexy	1
Diabetes	1
Hæmaturia	1
Total	39

The number of beds in the hospital is 55, but the average occupied is only 43. At the time of our visit there were 38 patients in the hospital, of whom 8 only were medical. These were chiefly in two wards by themselves; but the separation is not strictly observed. 2 might be considered acute cases. Of the 30 surgical patients, 7 were accidents, including 1 simple fracture; 7 were acute cases, including 3 operations of the selected classes, viz., 1 primary amputation of the leg and 1 for disease, and 1 primary amputation of the fore-arm. There was also 1 case of phagedæna not originating in the hospital. The other 16 cases were chronic or trivial, including a great number of ulcers of the leg. Out of the 30 cases, 24 were of open sore or wound. This is accounted for chiefly by the prevalence of ulcers.

T. H

IPSWICH.

IPSWICH AND EAST SUFFOLK HOSPITAL.—The hospital is just outside the town, to the west, on one of the highest sites in the neighbourhood of Ipswich. It has large and pleasant grounds around, which are partly laid out in plantations, partly as a kitchen garden, and partly as a flower garden. The patients have access at certain periods to portions of the grounds.

The hospital is a handsome compact building of two floors (excluding the basement), with a small outbuilding behind, in which are contained the dispensary, the out-patient department, and on the first floor a bath-room for the general use of the patients, and a small separation ward. The wards and rooms in the main building are simply and uniformly arranged, but in a manner easier to be understood by reference to a diagram than by verbal description.

The hospital contains altogether seven wards and 42 beds. Two wards on the ground floor, containing eight beds apiece, are the male and female medical wards respectively; two on the first floor over these, but larger than them, and extending from the back to the front of the house, contain 10 beds each, and are the male and female surgical wards. There are two small wards on the same floor, containing two beds each, which adjoin the operating theatre, and are regarded as the male and female accident wards. The seventh ward is in the back building, and contains two beds. It is used indifferently for male or female, surgical or medical cases, and is called into requisition only when a case requires isolation. The wards are of comparatively large size, and close upon 12 feet high. The cubic space allowed to each bed varies in different wards from 700 to 960 feet. The back ward, however, is an exception, for it is only seven and a half feet high, and the space for each bed is about 600 feet. Ventilation is dependent on doors, open fire-places, sash-windows of good size and construction, and ventilators in ceilings and walls. At the time of our visit all the windows were closed, and the wards consequently smelt close. There is no artificial mode of heating. The wards are lighted by candles only. They are clean, and have whitewashed walls. They are scrubbed once a week by the nurses,

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IPSWICH.

assisted by convalescent patients, and they are emptied and thoroughly cleansed and whitewashed once a year. The bedsteads are of iron, and have curtains at the head. The mattresses and pillows are filled with chopped straw, which is emptied out once a month, and generally after the departure of each patient. The water-closets open out of the lobbies, are clean, well supplied with water, and well ventilated. The drainage is into a cesspool, but is efficient. Water is laid on, and is abundant.

There are three resident nurses, two for the upstairs and one for the downstairs wards; a night nurse or an extra nurse is hired when necessary. Two physicians and four surgeons are attached to the hospital, and there is a resident house surgeon. A dispenser attends daily. Stimulants are largely employed; depletion rarely, if ever. Water dressing alone is used in the treatment of wounds, and sponges in their cleansing.

The patients of the hospital come from Ipswich and the eastern part of Suffolk. They consist chiefly of agricultural labourers and domestic servants, but include many men injured in Ransom's ironworks. They are admitted once a week by letter, but accidents and cases of emergency are received whenever application is made. All infectious fevers (including typhoid), primary syphilis, and for the most part secondary syphilis, cases of insanity, incurable cases (including phthisis), and women more than three or four months gone in pregnancy, are excluded. Phthisical patients, however, occasionally are received, and so also are cases of scabies. The medical and surgical cases are as much as possible separated, but there is no actual rule on the subject.

Of the 42 beds which the hospital contains, 20 are for males exclusively, and 20 for females, and generally 16 beds are regarded as being under the care of the physician. At the time of our visit there were 30 patients in the hospital; 16 males and 14 females; 10 medical and 20 surgical. Of the medical cases all were trivial or chronic. Of the surgical, two were cases of compound fracture of the leg, four were cases of simple fracture, one was a case of convalescence from lithotomy (a child), one was a case of amputation above the knee for disease (doing well), and the others were chronic or unimportant cases.

The hospital records show that during the year ending June 1st, 1863, 240 cases were admitted, and 12 (or 5 per cent.) died; that during the previous year 224 cases were admitted, of which 5 (or 2·2 per cent.) died; and that during the year before that 232 cases were admitted, of which 12 (or 5·17) died. The medical cases which were admitted seem to us to have been very trivial, for the most part; but the surgical comprised a fair number of accidents and of capital operations. Thus, to take the deaths for the three years which have been quoted above, we find that in the latest of the three years there were two deaths after operation for strangulated hernia, one from fractured skull, and one from accident, the others being chiefly chronic medical cases; that in the previous year there was one death from strangulated hernia, and one from ruptured liver; and that in the year before that there were two deaths from burns, one after compound fracture, one after lithotomy, and one after herniotomy.

Operations would seem to be tolerably numerous in proportion to the size and position of the hospital, for in the 18 months ending with June 1863, 22 capital operations were performed, of which 6 were cases of lithotomy, and 1 a case of lithotrity, 5 were cases of pathological amputation of the thigh, 6 were cases of amputation below the knee (1 being for accident), and 1 was a case of amputation of the hand. None of these were fatal, but there were also 3 operations for strangulated hernia, of which 2 resulted in death.

Pyæmia, phagedæna, and typhoid fever are said to be unknown as originating within the hospital. There has been one case of erysipelas within the last two years.

The average number of beds occupied for the last two years is 38; and patients are allowed by rule to stay two months in the hospital, and on the average this time is fulfilled.

This must be regarded as a purely country hospital. Few medical cases of interest are admitted, and doubtless in great measure because the rules of the hospital tend to exclude acute and serious cases. The surgical practice, however, judging from the number of operations performed during the last 18 months, and from their character, would seem to be valuable.

J. S. B.

LANCASTER.

LANCASTER HOUSE OF RECOVERY.—This is quite a small country hospital. It was originally merely a dispensary, to which after a while, accommodation for a few in-patients was added, and to which subsequently a fever house was attached. It is situated within the town, in a street, and is surrounded by streets and houses. It has a small airing ground behind. The hospital consists of two portions; the main building and a wing. The former was originally a private house, and has still all the characters of a private house. It consists of three floors. On the ground floor are the rooms for out-patients, the dispensary, and a room for male convalescents to sit in and take their meals. On the first floor are three rooms used as wards, two for females with two beds each, and one for males, with six beds; one of the former rooms is also the bath-room for in-patients. On the second floor are three rooms, which contain two beds each, one of which is occasionally used for small-pox patients. The others are practically not wards at all. The wing projects backwards at right angles from one side of the main building, and contains two floors. The ground floor is used as a laundry; the other contains the wards. These are 3 in number, and open one out of the other. The first on entering is the male fever ward (made for 12 beds, but containing only 4). Through this is reached the female fever ward, which is of the same size, and has six beds; and beyond

LANCASTER.

this, again, are two small rooms, each occupying half the width of the building, one of which is a private ward for one patient; the other is a lavatory, with water-closet attached.

The wards in the front house are small, and ventilated with windows on one side; the other side either abutting on other rooms, or on the staircase. The wards in the fever house are considerably larger, have windows on both sides, and ventilators in the ceiling. There is an inconvenience in regard to these wards, that the female ward can only be reached through the male ward. The floors are of deal, and scrubbed regularly once a week. The walls are all whitewashed, and were scrupulously clean. The wards are thoroughly cleansed once a year. Open fire-places and gas are every where in use. The bedsteads are of iron, without posts or curtains. The mattresses are filled with chaff, which, after death or fever cases, is thrown away. There are water-closets on both floors in the front house, and two (one for the males on the landing, and one for females opening out of the ward,) in the fever house. They are all well drained, well supplied with water, and free from ill smell. There is one bath-room for in-patients, which is only occasionally used.

There is only one nurse for the entire house, and she acts also as matron. The wards are scrubbed by the housemaids. There are five surgeons, but their chief duties are with the out-patients. A house surgeon lives in the house. Leeches are occasionally used, but, as a rule, depletion is not had recourse to. Stimulation is employed largely. Water dressings are used to wounds.

Patents are admitted daily by letter; a few accidents are received without recommendation. Applicants for admission are chiefly the poor of the town, including factory hands, farm labourers, and servants. Few come from the surrounding country. All fever cases are admitted, but syphilis, phthisis, and other chronic or incurable cases, are as much as possible excluded. A carriage is kept at the hospital for the conveyance of infectious cases, the patient's friends finding the horse. Fever and small-pox cases are separated, but surgical and ordinary medical cases are mixed together.

Including all the rarely used wards on the second floor, the hospital contains 27 beds. Of these 10 are for males, 10 for females, and the remainder for either one or the other. Eleven of the beds are for fever cases, and 2 for small-pox.

At the time of visit the wards seemed well ventilated. The hospital contained only 6 patients (4 males and 2 females), of whom two were suffering from typhoid fever, one from burn, one from abscess of the thigh, one from crushed foot (toes amputated), and one from orchitis.

The average daily number of patients in the hospital during the year 1862 was about 7, and the average stay of each was a little over 36 days. During the year 76 patients were admitted, and 7 (or 9·2 per cent.) died. Of these 38, with a mortality of 7·9 per cent., were medical, and 38, with a mortality of 10·5 per cent., were surgical. The admissions comprised a considerable proportion of serious cases; as, for example, 12 cases of small-pox, 10 of typhoid fever, 1 of scarlet fever, 2 of erysipelas of the face, one case of fracture of the skull, 5 of compound and 4 of simple fracture. Of the 7 deaths, 2 were the result of phrenitis, one of tetanus after a crush and amputation of the fingers, one from fracture of the skull, one from sloughing after compound fracture of the leg (and suspected pyæmia), one from amputation of the upper arm after compound fracture, and one from a cause not ascertained. Besides the amputation cases given above among the deaths, there were three amputations of the leg during the year for caries of foot and ankle.

In the year 1861, 94 cases were admitted, and 6 (or 6·3) per cent. died. Of these 38, with a death-rate of 10·5, were medical, and 56, with a death-rate of 3·6, were surgical. The cases were of much the same class as those given above. The deaths were due, 2 to phthisis, one to tetanus after amputation of hand for crush, one to lithotomy, one to typhoid fever, and one to phrenitis. The only capital operation, besides those given among the deaths, was a successful case of amputation of the arm for gun-shot wound.

This hospital is purely a country hospital, and as regards cleanliness and in many other respects a very good one. It differs from many, however, in its rules, which tend to the admission of a considerable proportion of serious cases, and hence to the prevalence of a rather high mortality. There are scarcely sufficient operations to enable one to judge of their general success. A case of pyæmia was said to have occurred a few days before our visit; but this disease, and other diseases originating in the hospital, are evidently rare.

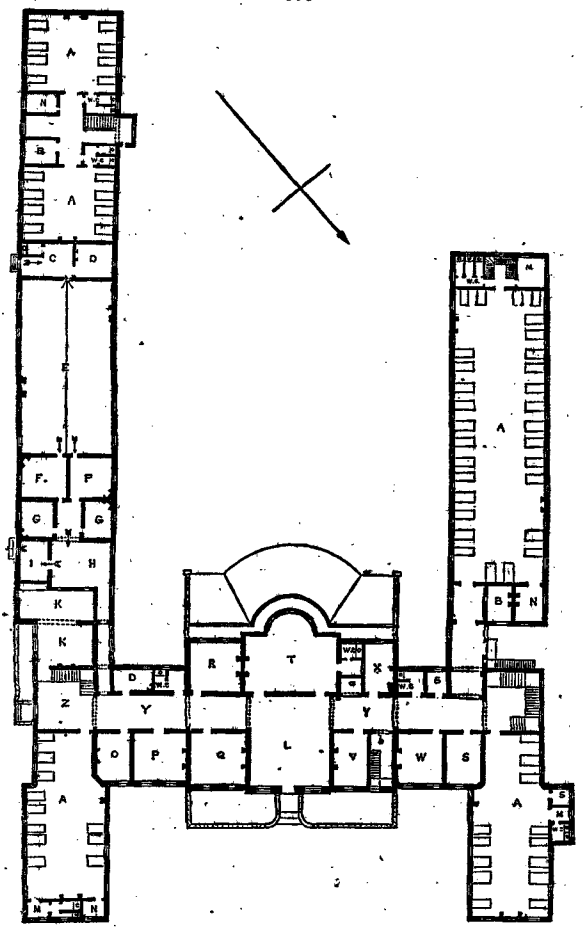
J. S. B.

LEICESTER.

THE LEICESTER INFIRMARY AND FEVER HOUSE is situated on the outskirts of the town of Leicester, and consists of two distinct parts, indicated by its title. These two parts are completely separated both in their construction and regulations; but they are under the same roof, and are managed by the same officers.

The hospital is of quite modern construction*, and may be regarded as in many respects the model of a country hospital. The plan annexed will show its construction, which is perfectly simple. It resembles the letter H, but one of the wings is more prolonged than the other, the projecting part being the fever house, separated from the main building by a corridor and double doors, through which, however, there is access to it from the general hospital on the first floor.

* That is to say, the old building has been modified, and the new part (including all behind the transverse portion) added. The new wards have been in use rather more than two years.



AA Wards.
B Baths and Lavatories.
C Out-Patients' Entrance.
D Porter.
E Out-Patients' Waiting Hall.
FF Physician's and Surgeon's Rooms.
GG Private Examination Rooms.
H Dispensary Waiting Hall.
I Out-Patients' Exit.
K Dispensary.
L Entrance Hall.
MM Scullories.
NN Nurses' Rooms.
O Surgery.
P Pupils' Sitting Room.
Q Library.
R House Surgeon's Sitting Room.
S Stores.
T Board Room.
V Matron's Sitting Room.
W House Dining Room.
X Secretary.
YY Corridor.
ZZ Staircases.
a Hoist.
b Private Stairs.
c Porter's Lodge.
d Museum and Mortuaries.
e Wash-house, Laundry, &c.
WC Water-closets, &c.

NOTE.—The large Wards are 100 ft. × 30 ft., and 16 ft. high, and allow 1,600 cubic feet of space per bed. The Fever Wards allow 1,800 cubic feet per bed.

LEICESTER INFIRMARY.—Ground Floor.

The transverse portion and the short projecting pieces in the front of the hospital contain remains of the old building. Two small wards are shown on the ground floor, and others exist over these, and also in the transverse part on the first floor, but they have been modified in the alterations. On the first floor there is a long ward in either limb of the H over the out-patient department on the one side, and over the long ward on the other side of the plan. They both correspond exactly in arrangement with the latter. There are also a few smaller attic wards on the second floor. All have thorough ventilation, except a few of the older wards.

The wards in the fever house, though much smaller, have the same general construction.

All the wards, but especially those of new construction, have a very large cubical content (1600 feet per bed in the general hospital and 1800 in the fever house). The new wards are of noble proportions, extremely light, airy, and cheerful, the furniture handsome and tasteful, and the whole having an air of comfort too seldom seen in our English hospitals. The floors have been smoothed, and are scrubbed and dried weekly, and in the fever house twice a week. The beds in the older parts of the hospital are about 4 feet apart; in the new wards they are 6 feet in some places, but much closer in others. The lavatories and nurses' rooms are placed at one end of the new wards, and the water-closets and sculleries at the other. All these arrangements are excellent.

Besides the natural ventilation, there are openings near the floors communicating under the floor with the outer air, for the entrance of fresh air, and others near the roof leading into a shaft which runs along by the side of the chimney, for the escape of foul air.

The bedding is made of horse hair, except that straw mattresses are used for offensive cases, and destroyed afterwards.

With respect to the regulations of the hospital, they seem identical, as respects the general hospital, with those of most country infirmaries, the patients being received chiefly by subscribers' letters, and the one recommended by the largest subscriber having, in case of want of room, the right to preference. The cases admitted by letter form about three fourths of the whole, and the emergencies are in a ratio of about three to four accidents. Thus it is seen that both accidents and urgent cases are rather few at this hospital; nor is the hospital at all pressed for room. The whole number of beds in the general hospital is 168. At the time of our visit there were 132 patients, and this seems a tolerable average. The fever house contains 32 beds in four wards, two on the ground floor and two on the first floor. Small-pox and scarlet fever are excluded, and it does not seem that typhus fever has prevailed in Leicester. At the time of our visit the cases (23 in number) were all classed as typhoid; a disease said to be very prevalent here.

The results of practice here are apparently good. The per-centage of deaths in the general hospital is about 5·7. The total admissions into the hospital and fever-house in 1862 were 1,226.

Operations are thought to do well here, as a rule. Amputations are not very common, and excision of the joints seems not to be practised; but stone is a very common affection. The median operation seems the one always performed. The list for the last three years, 1860-62, inclusive, is appended.

	No.	Died.
Amputation of the thigh for injury	4	2
" " disease	7	1
" " at hip joint	1	0
" leg for injury	3	0
" " disease	2	1
" arm for injury	1	0
" " disease (at shoulder)	1	0
" forearm for injury	5	0
" " disease	5	0
Total of amputation	29	4
Median lithotomy in the adult	8	1
" child	16	3
Herniotomy	6	4

Notwithstanding the healthy situation, excellent construction, and apparently good management of this hospital, it is not free from secondary surgical affections, erysipelas and pyæmia being tolerably frequent. Out of 70 deaths in 1862, 3 are referred to pyæmia. Erysipelas is also mentioned in 3 cases; but in two of these it originated out of the house, and in the third case there was Bright's disease.

No disease has been seen to spread here. One of the fever nurses suffered from fever, but in general the health of the residents in the hospital is good.

At the time of our visit there were 155 patients in the whole hospital, to a total of 200 beds. Of these, 23 were cases of typhoid fever. Of the patients in the general hospital, 48 were medical and 89 surgical. In the medical cases there were an unusual proportion of acute diseases, 19 of the cases being classed as acute, and 24 as chronic or trivial. Of the 89 surgical cases, 10 were accidents, including 2 simple and 3 compound fractures, and 1 burn. 28 were acute or grave cases, including 1 amputation of the thigh, and 1 of the leg, both for disease; and 1 case of lithotomy. The remaining 51 were chronic or trivial. The number of open sores in the house was 45.

T. H.

LINCOLN HOSPITAL.—This is a country hospital of the ordinary kind; that is to say, it is situated in the chief town of a large agricultural district, has no medical school, and is supported solely by the local gentry, tradespeople, and country parishes. Nothing can be more healthy at first sight than the position of this hospital, which stands close to the cathedral, on a great hill overlooking the fen country, and rising so abruptly out of the town of Lincoln as to be quite inaccessible to vehicles on the side turned towards the town; yet the hospital is not so healthy as its position might seem at first sight to promise, or, perhaps, it would be more correct to say, that the hospital was not so healthy some years ago as it should have been, but that improvements in certain respects, which will be specified, have been made, and their effect hitherto has justified the hope that they will be successful.

The unhealthiness of the hospital was proved about four years ago by a severe outbreak of erysipelas, phagedæna, and pyæmia. These affections were not prevalent in the town at the time. They attained such a height that it became necessary to close the hospital for some months. Since that time the hospital has been much more healthy, although secondary affections still occur occasionally. It is worth while to endeavour to learn on what this attack was supposed to depend, and what were the measures taken to meet it.

First, with respect to the town. It seems that Lincoln is situated partly on the sides and summit of the steep hill above referred to, on which the hospital stands, partly in the plain at its foot, through which runs a very sluggish river. The soil is detritus, laid over porous rock, underneath which is blue clay impervious to drainage. The drainage of the town is conducted in a great measure into cesspools, and as the strata are but little inclined from the horizontal, and the rock is porous, it seems probable that the sewage fluid permeates and contaminates the wells bored through this rock. The drains go into the river, which is at best a sluggish stream, and at the part where the hospital drainage flows in (the Brayford pool) is nearly stagnant. From these few facts it will be seen that the town itself is not in the best sanitary condition, and at the time referred to both the town and hospital were still less favourably situated, since in the former the drainage had not advanced so far as at present, and in the latter there was no drainage at all, except into a cesspool just in front of the building, from which there was little doubt that the exhalations regurgitated into the building. In fact, as the hospital was visited by the affections above described while the rest of the town was free, it is clear that some localised cause must have been at work in the building itself to produce them. The chief cause was, with great reason, referred to the defective drainage; and the main feature in the improvement of the hospital to which its comparative healthiness is now owing was the substitution for the above-described cesspool of properly constructed drains, going down the hill into the river. That even this system is not perfect is the fault, not of its construction, but of the natural features of the country. There were, however, other circumstances which seemed to have assisted in producing the result, and to remedy which was also, in part, the object of the improvements. These circumstances were defective ventilation and overcrowding. The Lincoln Hospital is a building of irregular construction, and a great part of it is nearly a century old. Like most hospital buildings of that period, it was composed of small wards, not so much ill provided with window space as having their windows improvidently placed for hospital purposes, the windows being wide and low, and at one or at two contiguous sides of the wards, so that it became necessary to crowd the beds together away from the windows. The wards were also absolutely confined as to cubic space per bed, there being under 1000 feet, and this space of course became relatively less from the beds being crowded together. The alterations consisted in building the projecting wings shown in the plan, by which wards were obtained with opposite windows, and at the same time keeping the number of beds nearly to the same level, 101 instead of 97, so that the cubic space per bed was increased, and the beds allowed to be placed farther apart.* At present there seems to be only one ward in the house where the space is less than 1000 cubic feet, and in most it is far above this. Thus far the improvements appear to have been judiciously conceived and successfully carried out; but there remain some things which can hardly be remedied. From the defective outfall, the drainage cannot be perfect; from the confused construction of the hospital, thorough ventilation is impossible; and in the old part of the hospital the old plaister floors have been left, which look very comfortless to an eye unaccustomed to such things, crack under the wear and tear (especially of crutches, &c.), and appear difficult to keep clean. Add to this that the water supply appears rather limited.

Thus there appear to be some drawbacks to the success of this institution, if it were intended as a hospital for acute diseases. But it can hardly be too often repeated, that as they are at present organized most of our country hospitals are not so intended. At Lincoln all fevers are, by rule, excluded, and all patients must produce a letter, except those who are suffering from accidents. The consequence is a languid circulation of the patients, and a comparative limitation of the benefits of the charity to those who can be least benefited by it, as far as their health is concerned, viz., chronic cases and visceral diseases. This assertion may be supported by the published reports, imperfect as such documents must necessarily be. Thus we have the total number of in-patients in 1862, 779; but from this total we must deduct 123 for renewed letters, leaving 656 for the real number of individuals admitted into the house with its 101 beds. This gives about 6½ patients for each bed. Of these 122 were admitted for surgical accidents; but the accidents

* It should also be added among the improvements effected at this period that the deleterious practice of using sponges in the surgical wards was now abandoned.

LINCOLN.

were in many cases devoid of danger to life, contusions, injury to the fingers, simple fractures, dislocations, and sprains forming the great majority; while there were only 12 cases of compound fractures of the limbs, burns, and scalds put together. Exclusive of the 123 renewed letters and 122 accidents, we have 534 patients admitted in the ordinary course. Of these the majority seem to have been suffering under diseases which were in no respect dangerous to life. In fact almost all the medical cases, except those of phthisis and diseased heart, appear to be of this class; so that eye cases, hysteria, pain in the head, chronic bronchitis, catarrh, dyspepsia, uterine complaints, chronic rheumatism, skin diseases, and ulcers count for more than 200 of the admissions; while of the numerous cases entered as "diseased" joints the majority no doubt were of this class. Hence there would be no reason to expect a high rate of mortality. The per-centage of deaths for the three years 1860–62 would seem at first sight to be only 3·7, but this per-centage would be raised if the proper correction were made on account of the "renewed tickets," for which the data are not given in all the reports.

The causes of death are very fully and well given in the reports, and appear to bear out the preceding remarks. Thus we see that out of the 64 deaths in these three years, 5 are attributed to pyæmia, 8 to the direct effect of accident, 18 to acute surgical disease or operation, 5 to cancer and tumour, 19 to visceral disease, 4 to acute medical affections, and the other 5 to chronic surgical diseases.

At the time of visit, in the middle of August, the hospital happened to be at its emptiest, on account of the harvest. There were only 63 patients; 17 medical (all chronic); 46 surgical; of whom 13 were accidents, including 6 simple and 1 compound fracture, and 2 burns or scalds; 13 acute cases, including one operation of the classes selected, viz., lithotomy; and 20 chronic surgical cases. There were 3 cases of erysipelas in the house, but only 1 had originated there. The number of open wounds was 23.

There were no statistics of operations kept; but it was ascertained that in 1862 there had been—

3 amputations of the thigh; 1 death.
3 of the leg.
2 of the arm, 1 at the shoulder joint.
2 lithotomy (both children).
1 hernia; died.

T. H.

MAIDSTONE.

WEST KENT GENERAL HOSPITAL, MAIDSTONE.—This, which is a small country hospital, is situated on the outskirts of the town, on high ground, and with plenty of open space around it. There is a yard behind, to which patients have access; but the governors have recently bought several acres of land, which it is intended to devote to hospital purposes.

The hospital is symmetrical in its outer form, and nearly so in its internal arrangement. It consists of a centre portion of three stories, and basement, and of two wings, which are a story lower. The right wing has been recently added, and the left wing, which is older, has recently undergone modifications. These changes were completed about the close of 1862.

The centre building, on the first floor, consists of a transverse central corridor, forming, with the entrance hall and front staircase, in front, and a back staircase behind, a complete cross, the four angles of which are occupied by rooms, of which the two at the back are used as day-rooms for convalescent patients. On the ground floor the arrangements are almost similar; but there is here a small room with one bed, intended for a separation ward. The second floor has, like the others, a corridor, and a back staircase, but it has no front staircase, and it presents, in addition to sleeping apartments for officials, three female wards, two at the back and one at the front of the house, containing two, three, and four beds respectively. The wards in this building are low, with windows on one side only, and ventilators over the doors and fire-places and in the ceiling.

The right wing contains two male wards; one on the ground floor and one on the first floor. They occupy almost the whole of the wing; are large, lofty (especially that on the first floor), almost perfectly square, have two open fire-places, and large windows on three sides. They have, further, a hole above the door opening into the corridor, and a ventilator over each fire-place, communicating with an earthenware pipe, which ascends by the side of the chimney to the roof. The upper of the two wards has also ventilators in the ceiling. The windows are exceedingly well made, and open by sashes. The window frame is, at the lower part on the inside, about half a foot in depth, so that the lower part of the sash, when closed, sinks behind it to that extent, and when opened in the same degree, allows of the entrance of an oblique current of air between it and the upper sash, while the lower part of the window still remains perfectly closed. The floors are of wood, and are scrubbed frequently, but not at fixed periods. The walls are coloured. Each of these wards contains eight beds only, but might easily be made to hold several more. The beds are far apart, and the cubic space to each is obviously very large.

The lower part of the left wing is used for the dispensary and out-patient department. The first floor forms a ward for the reception of female patients. This ward has the same form and general arrangement as the corresponding ward in the opposite wing, but is considerably less lofty, and has a larger number of ventilators in the roof, but none in the wall. Originally this ward was ventilated artificially, but the plan was found inefficient, and has been discontinued. The ward contains nine beds. The bedsteads are of iron, without posts or hangings of any description. The mattresses are of horse hair, and after any bad case are cleansed and fumigated.

MAIDSTONE.

The corridors and staircases occupy comparatively a very large portion of the hospital. They are handsome, well ventilated, and are heated by hot-water pipes. The whole hospital was clean and in good condition.

The water-closets on the ground and first floors are wedged in as it were between the wings and the main building, and are approached from the corridors. They are well drained, and quite unobjectionable. The closet, however, for female patients, on the second floor, was offensive, and evidently required improvement. The bath-rooms are on the first floor, and in fact are one with the water-closets. The patients are bathed as a rule on admission. The water supply is good. Gas is used for lighting the hospital.

There are three nurses (two day and one night), who live on the premises, and have nothing to do with the cleansing of the wards. There are two physicians, two surgeons, and a house surgeon.

The treatment adopted is the reverse of depressing, and bleeding has fallen quite into disuse. Surgical wounds are treated by simple water dressing.

All, except accident cases, are admitted by letter twice a week. The cases excluded are women advanced in pregnancy, lunatics, persons with infectious diseases (typhoid fever occasionally admitted), and persons with ulcers, phthisis, dropsies in a late stage, and venereal diseases.

Applicants for admission come from Maidstone and the surrounding parishes, and comprise chiefly agricultural labourers, paper-mill workers, servants, and persons engaged in lime and cement works.

The hospital contains at present 35 beds, of which 16 are for males, 18 for females, and one is a separation bed. Of the two male wards, one is considered a surgical ward, the other a medical, but the distinction is not at all strictly adhered to. There is no such distinction in the case of the female wards.

At the time of visit the hospital contained 28 patients, of whom seven were medical and 21 surgical, and of whom 15 were males, 13 females. Of the seven medical cases, the four most serious were cases of ascites, hæmatemesis, heart disease, and epilepsy; and of the 21 surgical cases, four were cases of acute affections, four were accident cases, and the remainder were purely chronic or unimportant. The cases comprised 3 cases of compound fractures, all of which were doing well; one case of amputation of the breast, and 12 cases of open sores.

During the year 1862, 147 cases were admitted and 15 (or 10·2 per cent.) died. Of these, 67 were medical cases, of which eight, or 11·9 per cent., died; and 80 were surgical cases, of which 7 (or 8·7 per cent.) died. Of the surgical cases, 31 were admitted as accidents.

There were three cases of erysipelas in the ward last year, of which two were admitted with the disease and one contracted it in the house. There was also a death from pyæmia supervening on a surgical operation.

With the exception of accident cases, almost all patients admitted (both medical and surgical) were suffering from chronic complaints.

We were unable to obtain satisfactory information about operations, beyond the general statement that they generally do well.

The hospital itself is quite a rural hospital, and the new wards especially are in all respects admirable. It is interesting to observe, that during the one year 1862 erysipelas attacked one of the patients in the house, and that another patient died, after operation, of pyæmia. It is interesting too to observe that the mortality is high.

J. S. B.

NORTHAMPTON.

NORTHAMPTON HOSPITAL.—The hospital at Northampton is beautifully situated on a hill outside the town. The building stands in a large open space, not less than 16 acres of land around belonging to the hospital, which cannot be built upon. The patients have a garden of more than three acres for exercise. The building is faced with stone, and though more than a century old (an. 1744) is of excellent construction. The wards are all fully exposed to the air on at least one side, and the larger ones on both sides. They are lofty, airy, and very clean. The ventilation of the wards is only the natural ventilation, with the addition of openings above each window and in the ceiling. The small wards are merely ordinary bed chambers. The water-closets and sculleries are away from the wards, and everything is perfectly sweet, and free from odour. The amount of cubic space is about 1100 cubic feet per bed when the wards are quite full. The hospital is usually pretty full. The whole number of beds is 126. The average of five years on August 1st gave 112 patients. Besides the main building, there is a small subsidiary building, containing two wards, male and female, of seven beds each, intended for the reception of convalescents, or, in emergencies, for cases of infectious disease, &c., which might break out in the hospital.

Such diseases, however, could only be in hospital accidentally, since all fevers are by rule excluded, and the letter system, with weekly admission, prevails, and is even more strictly followed than usual, so that beds are frequently taken for a considerable time beforehand. Hence the cases both medical and surgical are chronic for the most part, except surgical accidents, which in the year 1861–2 bore the proportion of 159 out of a total of 1029 admissions. There is no strict separation of medical and surgical cases (except that there are accident wards, male and female), and the numbers of the two appear tolerably equal, as are also the numbers of male and female patients. A great part, if not the majority, of the patients come from the country, and are generally persons of sober and healthy habits.

Under these circumstances, it is not surprising that the mortality should be so low, that surgical operations should, as a rule, be successful, and that hospital diseases should rarely appear, and such appears to be the fact. The mortality on an average of the three years, 1860-62, was only 3·32 per cent. Of 33 deaths which occurred in the years 1861-62, and of which the causes are given in the report, 8 are due to accident,* and of the remaining 25 no less than 11 are attributed to phthisis†, and all the others, except 1, to visceral or chronic disease.

At the time of our visit the hospital contained 119 patients, 56 medical and 63 surgical; of the former, about 10 might be said to be acute, whilst of the latter 16 were accidents, including 3 simple fractures, 2 compound fractures, and 3 burns; 11 were classed as acute diseases, including 1 amputation of the arm, and 1 case of phlegmonous erysipelas (not originating in the house); the rest were reckoned as chronic cases. We were not able to obtain any definite statistical information as to the results of operations.

J. S. B. T. H.

THE NORFOLK AND NORWICH HOSPITAL is an old building, founded in 1771. It has some of the faults of construction which characterize almost all hospitals of that date, but is, on the whole, a favourable specimen of its class; and has received judicious improvements to adapt it to modern habits of cleanliness and to the improved system of drainage. The H shape (see plan) in which the building has been constructed allows of the exposure of both sides of most of the larger wards to the air, while it is convenient for the position of the dwelling rooms and offices. The hospital is placed on the outskirts of the town, and was originally outside it, just beyond the old wall of the city, but the houses have grown around it. It is situated on high ground, and has an ample space (about two acres) of garden ground for patients' exercise.

The great prevalence of stone in the neighbourhood of Norwich, and the successful practice of the hospital in this affection, are well-known facts; and it is, perhaps, to this latter particular that the hospital owes its great reputation in this part of the country, both as a hospital and a school of surgery. The surgical cases, consequently, comprise a larger average of acute diseases than is usually at country hospitals. The medical cases are almost entirely chronic, consequently at this hospital the death-rate of medical and surgical cases is nearly the same; the latter rather the higher. In 1862 the mortality of medical cases was 5·02 per cent., and that of surgical 5·14.‡ There is no separation between medical and surgical cases on the female side. The total number of beds in the hospital is 149, the average number occupied (in 1862) 121; so that the hospital is, as a rule, moderately full. The average duration of a case is 42 days; and here again we may notice, as showing the chronic character of the medical cases, that they last longer than the surgical; the average of the former being 44, that of the latter 40 days.

The reports of the hospital are drawn up with great care, and contain really valuable information. The following are some facts extracted from them. In 1862, 936 cases were admitted, 53 deaths occurred. Out of these 936 cases the number of cases of phthisis was 54, of dyspepsia 20, of hysteria 38, of chronic rheumatism 32, while there is only one case of acute pneumonia, and 7 of acute rheumatism. Fevers are excluded by rule, and the system of weekly admission by letters is followed. The table of deaths shows:—

Visceral diseases and chronic medical affections	16
Acute medical affections	7
Acute surgical diseases and operations	8
Cancer and tumour	5
Chronic surgical diseases	2
Accident	15
	53

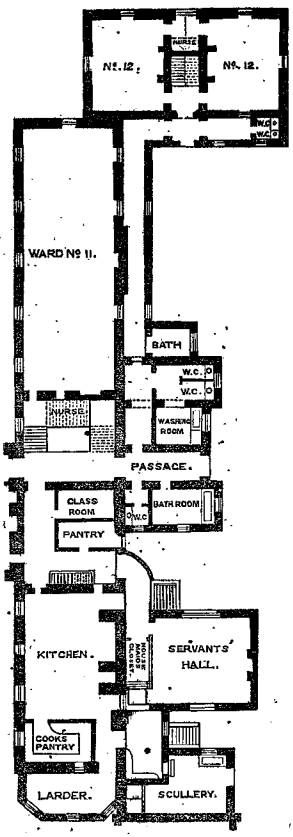
The table of operations for three years, 1860-62 inclusive, gives the following numbers and results:—

Amputation of arm at shoulder joint	1	—	
„ forearm	8	2	deaths.
„ leg	10	2	„
„ thigh	16	5	„
Lithotomy	42	10	„
Hernia	9	6	„
Excision of the knee	2	—	
„ elbow	1	—	

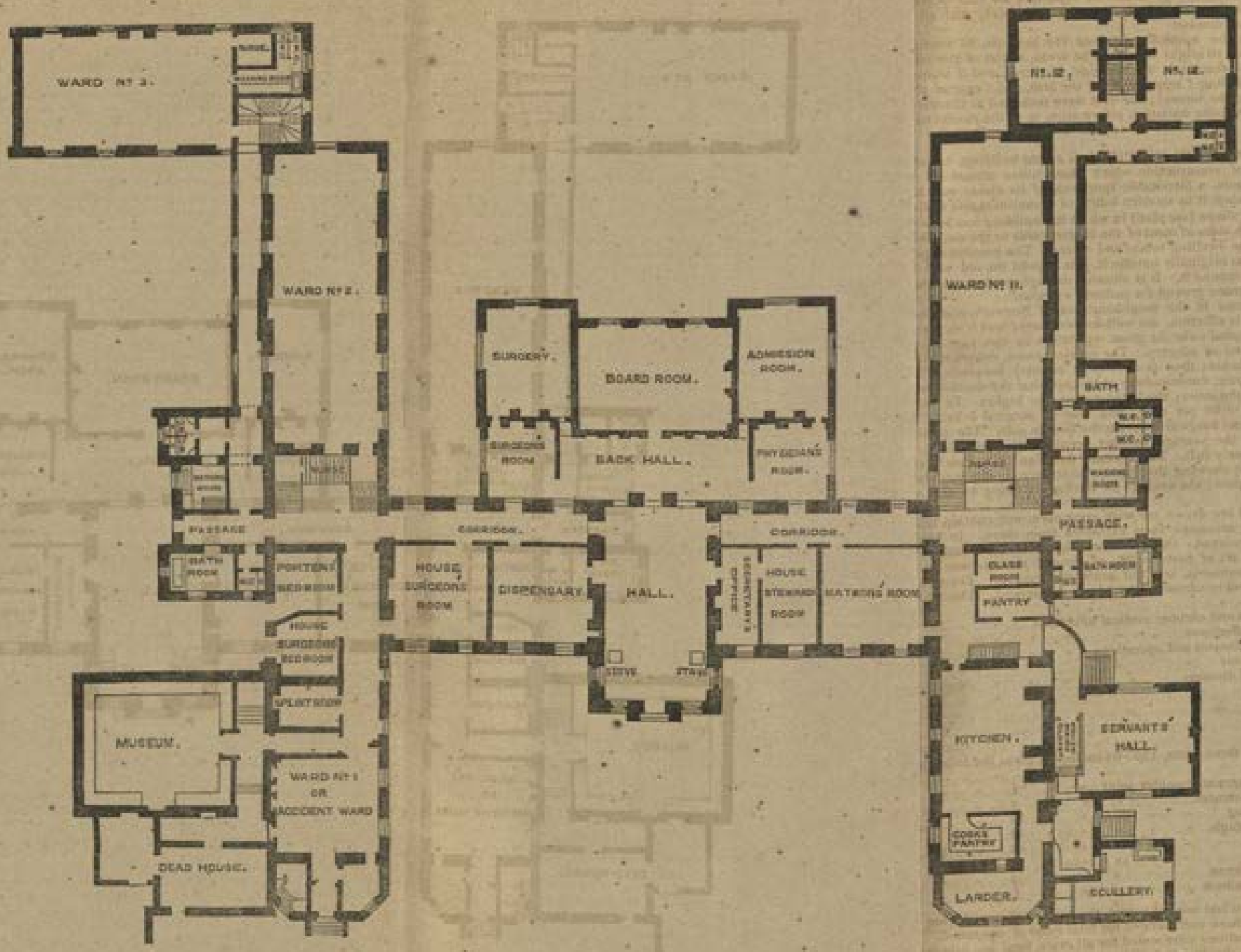
It may be noticed that in the last annual report, the custom of introducing a statement of hospital complications has been commenced for fatal cases of operation. It would be very desirable if such complications were stated for all cases, fatal and otherwise.

Erysipelas is rarely seen in the hospital, and then only, or chiefly, when it also affects the town It is very rarely fatal. Phagedæna is never seen. Pyæmia is an occasional

* The report says 7, but this appears erroneous.
† Whilst it should not be forgotten that many patients who feel themselves to be sinking from phthisis or such like chronic ailments request their discharge in order to die at home.
‡ In the year 1863, however, the death-rate of medical cases is higher, viz. 6·62 per cent. while that of the surgical is only 4·31. The death-rate over all the cases was 5·24.


Nº. 12.
NURSE
Nº. 12.
W.C.
W.C.
WARD Nº 11.
BATH
W.C.
W.C.
NURSE
WASHING ROOM
PASSAGE.
CLASS ROOM
BATH ROOM
W.C.
PANTRY
KITCHEN.
MAID'S CLOSET
SERVANTS' HALL.
COOKS PANTRY
LARDER.
SCULLERY.

(*To face p.* 658.)



NORFOLK AND NORWICH HOSPITAL.

(To face p. 638.)

NORWICH.

(but not a common) cause of death, after injury or operation. 3 deaths from this cause occurred in 1862, 2 in 1863; but none are recorded in 1861 or in 1860.

A few particulars with reference to the construction and details of the hospital remain to be noticed. It has already been mentioned that the chief part of the building is more than 90 years old. As is usual with hospitals of that antiquity, the building is broken up into a number of small wards, a plan which appears to be open to these objections, viz., that it has a tendency to sacrifice space, to impede ventilation, to render the chambers less cheerful, and to increase the trouble of nursing. It may be noticed in passing that at Norwich the old custom is kept up of the nurses sleeping behind a screen in the ward; and curtains are used in the wards. Besides, in order to accommodate the number of patients whom it seems necessary to receive into the house, the beds have had to be placed closer together than would be found advisable in any hospital where there were numerous acute medical cases, or numerous large suppurating sores or burns; in fact, offensive or contagious affections of any kind. Two of the larger wards on the ground floor (Nos. 2, 11.) (see plan) have lost the advantage of thorough ventilation by the interposition of a corridor leading to the new wards added on to the original building. Still, on the whole, the ventilation is quite adequate for the cases in the wards, and the average of cubic feet per bed is in general 1200 or 1300, and only in two small wards below 1000. Cases of operation are placed in separate wards (of eight beds each for males and females) on either side of the operating theatre. The advantage of this plan must be presumed to have been sufficient to recommend it to the surgical staff of the hospital. In theory it would seem to be open to the objections, that it is liable to increase the patients' dread of the operation, and that it tends to collect into one small ward a large number of the most acute cases on the surgical side of the house, by which means the atmosphere is loaded with the exhalations of numerous large suppurating wounds.

At the time of visit there were 135 patients in the hospital, of whom 49 were medical; of these 49 perhaps five might be classed as acute. Of the 86 surgical patients, 22 were cases of accident, comprising six simple and one compound fracture; no burns or scalds, 21 were classed as acute cases, comprising four cases of lithotomy, one amputation of the arm, one of the forearm, one excision of the knee, and one of the elbow. The remaining 43 cases are classed as chronic. There were no cases of secondary or hospital affections in the house. The number of open sores was 26.

T. H.

NOTTINGHAM.

NOTTINGHAM GENERAL HOSPITAL.—This hospital is situated on a hill, in the western part of the town, not far form the market-place. It occupies about two acres of ground, and has a garden in front of nearly an acre, to which patients have access at certain hours.

It is built on an incline, and that end of it which stands on the lowest part of the incline, has a basement. Besides this, there are three floors. The hospital was originally a symmetrical building, but has had additions made at either end, which render its general plan now irregular.

The older central portion of the hospital presents (taking the first floor of the hospital for description) a corridor running in the middle line from end to end, with wards and rooms arranged pretty uniformly along either side of it. The extreme rooms, and in a less degree the central ones (back and front), project to some extent beyond the general line of frontage. There is a staircase towards each end of the building, occupying a portion of the space in front of the corridor. The left extremity of the corridor extends beyond the main building, so as to give space in front for a water-closet and scullery, and is provided with a window. The same arrangement evidently obtained originally at the opposite extremity, but alterations have led to the replacing of the window by a door, and of the water-closet by a small lobby. The addition which has been made to the left extremity of the hospital consists simply of a block, extending laterally a little beyond the end of the corridor, but having its longest axis at right angles with that of the old building, and extending backwards considerably beyond its corner ward, which it adjoins. This block contains a passage, a nurse's room, and a ward of moderate dimensions. The changes that have been made at the other end are much more complex. In the first place, the corridor has been prolonged beyond the door, and water-closets, lavatory, and a private room have been built in front of it, and it terminates by opening into the chapel, which projects forwards considerably beyond the general level of the hospital, but the back of which is in a line with the back wall of the corridor. On the other side of the chapel, again, is a corridor in a line with the principal corridor, which leads to the fever house. The addition which has been made to the back portion of this end of the hospital is also much greater than the addition at the other end. Instead of a comparatively small narrow wing, there is here a large nearly square block, extending to the right as far as the centre line of the chapel, and back some little distance beyond its fellow. This appears to have contained originally several small wards, but the walls separating them have been knocked down, excepting in those parts where the fire-places and chimneys were situated, so that now they constitute together a large square ward, partly subdivided by imperfect partitions. There is a small square ward, again, projecting from this.

The general hospital above described contains 19 wards and two day rooms, one for men and one for women. There are two wards on the ground floor; one in the left wing, containing seven beds; the other in the right wing, containing 11 beds. On the first floor there are 13 wards; one in the left wing, containing seven beds; one

occupying nearly the whole of the right wing, holding 21 beds; another, the small ward in the right wing, containing three beds; two small wards, with two beds each, one on either side of the operating theatre; and eight others with from four to eight beds apiece. On the second floor there are four wards with from four to seven beds each. The male day room is under the chapel; the female patients use the operating theatre for a sitting room.

The fever house has, like the other hospital, a transverse corridor, with wards at the front and back. It has an entrance from the chapel, and a separate staircase. There are two floors, the arrangement on both being alike. On each there are two moderate sized wards in front, with four and five beds respectively, and a series of small rooms behind, of which two, with two beds each, are used as wards.

The wards throughout the hospital are ventilated by open fire-places, by sash windows, and by ventilators in ceilings or walls, communicating with a central flue, and said to be of little use. The windows, excepting in the large back wards of the right wing, and in one or two others, are situated on one side only; and some of them, including all in the fever house, have a transverse diaphragm of perforated zinc let into the upper part of the window frame, which, when the window is slightly opened, allows the air to filter through.

The water-closets themselves are well drained and well supplied with water, and those in the corridors and those belonging to the fever house are unobjectionable. But the closets belonging to the wards in the right wing are very ill placed. The closet on the ground floor opens directly into the ward, and has no ventilation, except through the ward; and that on the first floor is small and stuffy, and also opens directly into the ward. On the whole, from its construction, the hospital must be difficult of ventilation, and one or two of the wards especially must be hard to keep sweet. We did not, however, observe any ill smell. The wards are scrubbed weekly by the under nurses and night nurses, and the hospital itself is thoroughly cleansed once in two years, the walls being partly painted and partly coloured. It was clean at the time of visit. The bedsteads are of iron, and many have curtains. The mattresses are made either of horsehair or of straw, and are taken to pieces after bad cases. The cubic space allowed to each bed varies considerably, the extremes being about 730 and 1400 feet. In many wards the beds are too close, in some they touch. There is a lift both for patients and for coals, &c.

There are 11 day nurses and four night nurses, all living entirely on the premises. Three of the nurses belong to the fever house, two day nurses (of whom one is a man), and a night nurse.

There are three physicians and four surgeons, a house surgeon, and an assistant house surgeon. Depletion is not practised, but neither is stimulation carried to great lengths. Water dressing is the usual application to wounds; cotton wool is used in the wards for cleansing wounds, and in the operating theatre, sponges.

Accidents, fever cases, erysipelas cases, and other cases of emergency (five or six a week), are admitted on application; but all other patients have to obtain a governor's letter, and to apply on a particular day in the week. Incurable diseases are excluded, as are also women advanced in pregnancy, children under six (except for operation), insane persons, and those suffering from itch. Applicants for admission are chiefly frame-work knitters and agricultural labourers; many are paupers, and many also of a class above those classes which ought to avail themselves of hospital assistance. Not many domestic servants gain admission. The majority of patients belong to the town and suburbs of Nottingham, but about one third come from the country around.

The hospital contains 142 beds, of which 80 are for males and 62 for females. Infectious diseases, and cases of erysipelas and primary syphilis, are placed in the fever house. There is a male and a female eye ward; and the general surgical and medical cases are in part separated from one another. The number of medical and surgical beds varies, but generally there are 66 or thereabouts of the former and 76 of the latter.

At the time of visit there were 127 patients in the house, of whom 76 were males, 51 females, and of whom 45 were medical and 82 surgical. Of the 45 medical cases, 10 were acute, and the remainder chronic. Among the former were 5 cases of fever and 4 of rheumatic fever; and among the latter, 8 cases of phthisis, 6 of albuminaria, and 3 of laryngeal disease. Of the 82 surgical cases, 8 were acute, and 23 were accidents, the remainder being chronic or trivial. Among them there were 12 (probably really rather more) open sores. 5 of the cases were simple fractures, 3 compound fractures, 1 a case of primary amputation of the arm.

The average number of patients in the house during the year ending March 1st, 1863, was 134·1; and their average length of stay was 38 days. During the same year 1202 patients were admitted, and 43 deaths occurred in the house, giving a mortality of 3·57 per cent. The per-centage of deaths since the formation of the hospital in 1782 is 4·9. The analysis of the cases admitted in 1862 shows 17 cases of infectious fevers; 91 of rheumatism, 54 of phthisis, 36 of heart disease, 40 of bronchitis, 43 of dyspepsia, 9 of albuminuria, and 21 of skin disease. Among surgical cases were 25 of venereal disease, 47 of eye disease, 7 of calculus, 6 of hernia, and 261 cases of accidents, including 29 burns and scalds, and a large number of fractures. On examining the deaths for the year we observe that 19 of the 43 were in surgical cases, and that of these 14 were the result of accidents. Of the medical deaths there is no special remark to make; the causes of death seem to have been very various. We have a list of operations performed at this hospital during 1861 and 1862, but it is imperfect, the nature of the operation and the result being frequently not given. It would seem from the list that

2 amputations of the thigh have been performed (1 for accident and 1 for disease), 3 amputations of the leg (4 for accident and 4 for disease), 5 amputations of the arm (3 for accident and 2 for disease), and 8 cases of lithotomy. The case of amputation of the thigh from disease died, and one of the lithotomy cases (that of an adult) also died. But we repeat, the result in many cases is not given. Neither the records of death nor the statistics of operations seem to be at all carefully prepared. Operations would seem, however, not to be very numerous, and it is stated that the results are satisfactory. There is said to be very little pyæmia and very little erysipelas, except in a sporadic form. In February 1862 a girl died of pyæmia after operation. In 1848 or 1849 erysipelas broke out in nearly every ward. It originated without obvious cause, and passed away equally unaccountably, and has never been epidemic since. Nurses and officials are said to enjoy good health.

This hospital must, we think, be regarded as purely a country hospital; it is well situated and clean, but has the defects which attend the combination of the corridor system and small wards. It would not, however, seem to be an unhealthy hospital, and its death-rate is very low, much lower in fact than that of certain other rural hospitals which we have reason to regard as models, structurally and otherwise, of what country hospitals should be.

It has habitually a large number of beds occupied; but the majority of patients are admitted by letter, and seem (with certain exceptions) to be suffering from chronic affections. The small excess of medical over surgical deaths seems to indicate that medical cases specially are on the whole neither serious nor fatal.

J. S. B. T. H.

THE RADCLIFFE INFIRMARY AT OXFORD is an old building, dating from the year 1770. It stands on the Woodstock-road, almost out of the city, on the north side, in a large garden of three acres. This garden, however, is not available to the patients, having been let off many years ago. It was, till lately, separated altogether from the hospital by a brick wall. The wall has now been removed, so that the patients have the benefit of the air of the garden; but only a small part of the grounds of the hospital can as yet be used for the patients' exercise. The situation is very airy and pleasant, the windows commanding an extensive prospect.

The hospital is built in a block, the ends projecting from the centre, but so little that the wards at the end do not obtain through ventilation by means of opposite windows, though they have windows on more than one side. The small wards have of course only one set of windows. The beds are placed rather close together, and the cubic space per bed is small, averaging about 1000 feet. The cases, however, are chiefly chronic, and the space and distance of the beds appear to have been found hitherto practically sufficient, since the cases do well. Up to some time in 1862, however, the hospital was more full of beds than it is now; since in that year the number was reduced from 158 to 148, its present number. Some wards, therefore, must have been overcrowded before that time.

This crowding seems to have been the less necessary since the weekly average of patients, which has been calculated for each of the last 10 years, is never stated higher than 120.

The wards are ventilated by ordinary sash windows and by brattices over the door communicating with the corridors, and there are also ventilating holes in the floors of the lower wards and in the ceilings of the attics. Most of the wards also have ventilating holes in their walls. There are two fire-places in each ward.

The water closets are separated, in most cases, from the wards by a corridor. The drainage is now good; but we shall have occasion to recur to this subject.

Besides this, the old part of the hospital, a new portion has just been opened. It consists of a male accident ward on the ground floor, built as a "ward-unit on the pavilion system," somewhat similar to the wards at Lariboisière.

We extract from the report of the building committee the description of this ward:

"The ward is 78 ft. in length, by 26 ft. 6 in. in width, and 18 ft. in height. Twenty bed-places are fitted up, giving to each bed 1860 cubic feet of air. There are six windows on the south, with a similar and opposite set on the north, excepting only the second from the entrance, which is replaced by a fire-place. The sashes are of oak, with stout plate glass ¼ in. thick, opening both at the top and bottom. To prevent draughts either through the window-frames or from the cold outer glass, glass frames have been provided resting on the window-sill, 2 ft. 4 in. in height, and of the same width as the window, which will in effect make the lower part of the windows double; and, if required, these frames can be raised to any height hereafter. Ventilation does not wholly depend on the windows. In the ceiling, between each truss of the roof, is a hinged trap-door, readily opened and shut; all together affording 72 superficial square feet of air passage into the roof space. The roof is pierced north and south, and east and west, by eight opposed open ventilators for the exit of foul and introduction of fresh air. Besides, in the centre of the floor, between the feet of the beds, are six apertures, which can be opened or closed, communicating with a chamber in a cellar east of the ward. This chamber is supplied with fresh air by an aperture 3 ft. by 2, and may be heated by the furnace which heats the out-patients' hall and the shop corridor. The air flue can be disconnected at will.

"In addition to these sources of air and means for promoting its due circulation, there are in each pier, between the windows, air flues with regulating valves, which open through the wall into the outer air."

No. 15.
The Hospitals of the United Kingdom, by Dr. Bristowe and Mr. Holmes.

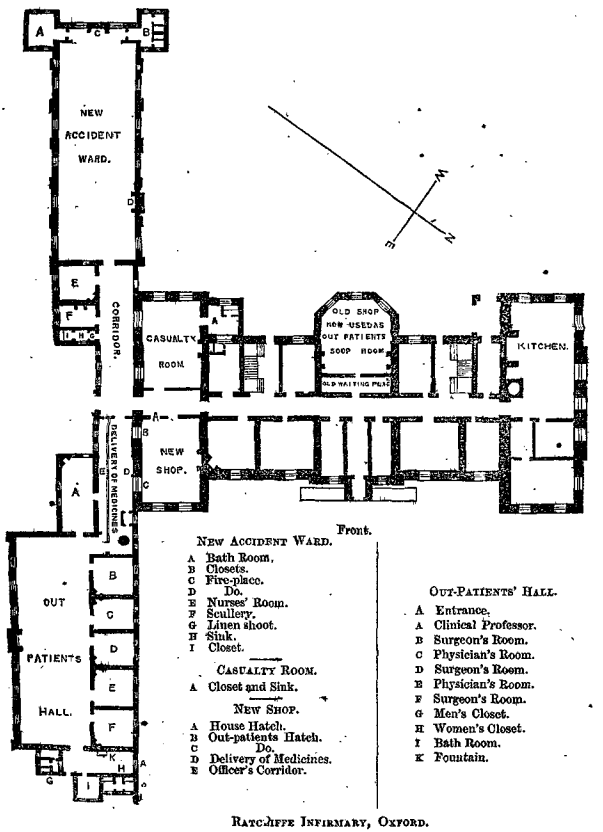
ENGLISH RURAL HOSPITALS.

OXFORD.

"There are two open fire-places, one on the north side replacing a north window, one at the west between the west windows. In the mantelpiece there is an aperture leading to the ventilating shaft which surrounds the flue. This shaft is constructed of Jennings's patent flue pipes.

"The ward is built over an excavated cellar, 9 ft. deep. The joists are plastered on the under surface, with pugging between them. The flooring is of 1-in. deal, with ¾ in. wainscot-oak laid upon it; the latter dowelled and side-nailed. A slight current of air passes between the plastering and the pugging, and also between the pugging and the double floor.

"The spaces on the floor under each bed are covered with white glazed Minton's tiles, with a glazed red border. These tiles are bedded in Portland cement, which rests on a bed of concrete laid in between the joists. Any moisture therefore spilt under the bed will lie upon the tiles, and may easily be wiped off the polished surface. Between



Front.

NEW ACCIDENT WARD.

A Bath Room.
B Closets.
C Fire-place.
D Do.
E Nurses' Room.
F Scullery.
G Linen shoot.
H Sink.
I Closet.

CASUALTY ROOM.

A Closet and Sink.

NEW SHOP.

A House Hatch.
B Out-patients Hatch.
C Do.
D Delivery of Medicines.
E Officer's Corridor.

OUT-PATIENTS' HALL.

A Entrance.
A Clinical Professor.
B Surgeon's Room.
C Physician's Room.
D Surgeon's Room.
E Physician's Room.
F Surgeon's Room.
G Men's Closet.
H Women's Closet.
I Bath Room.
K Fountain.

RATCLIFFE INFIRMARY, OXFORD.

the bed-places the floor is, as elsewhere, of wainscot, the tiles not projecting beyond the edge of an ordinary bed, that they may not be stepped on by patients leaving their beds.

"Over every bed is a bed-pulley. Curtains can be added, and fittings are prepared for curtain-rods; but Miss Nightingale having been consulted as to the best kind of curtains, and she having declined to advise on the way of fitting what she considered should not be fitted at all, the committee have not placed curtains.

"Two bed-spaces are placed between each window; and every patient is separated from his neighbour by 3 ft. on one side, and by 4 ft. 2 in. on the other, and has a window at the head of his bed.

"From foot to foot of the beds on opposite sides are 13 ft. 6 in., allowing 6 ft. 6 in. for the length of a bed. Down the middle of the ward will be placed cabinets on wheels for surgical appliances, and at the east end a dresser.

"The walls and ceiling are of cement, polished so as to prevent any noisome exhalations from lodging there. The tie-beams are of varnished deal. There are no ornaments or mouldings on which dust can rest. The colour of the cement is not uniform; the foreman who was engaged on it left in the middle of the work, and caused thereby some difficulty; indeed, the preparation of these walls has been troublesome in several particulars. Their cleanliness, durability, and cheerfulness make them, however, well worth the labour and expense.

"Besides the north and south windows, there are two west windows, one on either side of the fireplace. Every patient in the ward can look, if he will, down the garden in summer, and in winter upon the open fire.

"At the south-west angle is a bath-room and a lavatory, also lined with polished cement. They are supplied with hot and cold water; the basins are of enamelled iron in a slate slab, with supply and waste pipe; the bath is on wheels. At the north-west there is a double closet, separated by a passage, and a urinal, all thoroughly ventilated. The bath-room and the closets are separated from the ward by swing doors, and outside these a warm-air flue from the hot-air apparatus, to approximate the temperature of the closets to the ward in severe weather.

"There are provisions for water supply on the *self-acting* process.

"The nurse's room to the east of the ward looks down the ward, but does not open into it, that she may have means of surveillance without loss of privacy. It has its own fire-place.

"Beyond the nurses' room is a scullery, with a small range for occasional cooking.

"Further east is a window-hatch for throwing foul linen into a truck outside the building; a sink for slops from the ward, and a private closet for the nurses.

"On the other side of the entrance corridor is the casualty room, with its own proper appliances. A doorway leads hence into the garden for the use of the patients."

Besides this accident ward, which is described here as a subject directly bearing on the health of the hospital, and on the ideas now prevalent for the construction of wards, the new additions comprise an out-patient department, the object of which is to separate the out-patients entirely from the hospital. The importance of this object, and the best means of effecting it, will be found treated of under the head of "Construction of Hospitals."

There is also a separate building in which cases of scarlet fever are placed, and where bad cases of typhus or typhoid fever are sometimes sent. An order was made some years since that cases of erysipelas should also be separated, but this is not observed.

The cases are mostly chronic, the letter and weekly admission system being very strictly adhered to, although no disease is excluded,* except small-pox (which does not prevail much at present at Oxford), and cholera, which has not been present for years. Thus in 1862, out of 896 patients admitted, 138 were surgical accidents, and only 10 urgent cases without letters. The death-rate appears to be about 4 per cent.

The wards are now washed twice a week, and whitewashed every year. The bedding is of flock, and the mattresses are carefully picked over after every infectious or dirty case.

Some years ago these precautions were not attended to, and an outbreak of erysipelas occurred, which subsided on a more cleanly system having been introduced into the hospital. At that time the patients used to lie on straw mattresses, and the discharges were allowed to accumulate in the bedding without its ever being changed. This was the fault of the then matron. On a new matron being appointed, and the present system being introduced, the disease disappeared, and has not been troublesome since. At the period of its prevalence it was frequently so serious that circulars used to be sent to the subscribers, begging them not to send patients to the hospital. But we should not omit to state, that although (following the opinion of a gentleman who was then resident in the hospital) we attribute the prevalence of erysipelas and the unhealthy state of the hospital mainly to want of cleanliness, two other causes were at the same time in action, and doubtless contributed to bring about the result. The ventilation of the wards (which was already rather deficient in space, as noticed above,) was impeded by partitions or bulkheads (called cabins) placed between the beds, and there were cesspools in connexion with the drainage, diverticula, as it were, from the main drains, which were receptacles of filth, and from which foul gases used to regurgitate up the drains. The removal of the bulkheads, the improvement of the ventilation of the wards by the openings made into the corridors, and the filling up of the cesspools, have quite cured this state of things, and for more than ten years erysipelas has ceased to be a source of grave anxiety, although scattered cases of cutaneous erysipelas still occur. Pyæmia is also exceedingly rare, and sloughing phagedæna is unknown. These observations apply to the town as well as the hospital.

* On this account, and perhaps also on account of its connexion with the University school of medicine, the medical cases are less trivial here than at most rural hospitals.

As to the success of surgical operations we append the following list:—

AMPUTATION of LIMBS in 1860-61-62-63.

	Disease.		Injury.			
			Primary.		Secondary.	
	No.	Died.	No.	Died.	No.	Died.
ENGLISH RURAL HOSPITALS.						
Thigh	11	—	1	—	—	—
Leg	12	1	5	3	2	2
OXFORD.						
Thigh and Leg	—	—	1	1	—	—
Upper Arm	—	—	4	2	1	1
Fore Arm	1	—	1	—	—	—
Total	24	1	12	6	3	3

Hernia, 8 cases, 4 deaths. Lithotomy, 5 cases, no deaths.

At the time of our visit there were 106 patients in the house; 28 of these were medical, 4 of whom might be reckoned as acute cases. Of the 78 surgical cases, 24 were accidents, including 7 simple fractures, 1 compound facture, and 2 burns or scalds; 16 were acute cases, including 4 cases of amputation, 1 primary of the arm, 2 primary and 1 for disease of the leg, and 1 case of erysipelas not originating in the hospital: 38 were chronic or trivial cases. There were 25 open wounds or sores. J. S. B. T. H.

PLYMOUTH.

SOUTH DEVON HOSPITAL, PLYMOUTH.—The Plymouth hospital is situated in the south part of the town, close to the sea. It dates from the year 1840. It has a small piece of ground about it, and the neighbourhood is by no means crowded. Few positions could be chosen better suited for a hospital intended to accommodate the sick of a large town. The patients are provided with an amount of cubic space (1100 feet on an average) which must be allowed to be beyond that given by most country hospitals.

The accommodation for patients is at present 70 beds, which will be increased to 106 by new wards which are now built, and will soon be open for the reception of patients. This addition has been necessitated by the pressure on the resources of the hospital, which is often quite full, and the average daily number of patients amounts to 65.

The regulations are those of most country hospitals, viz., a weekly admission by letter, excepting emergencies and accidents, and the cases, consequently, are chiefly chronic, except surgical accidents. The wards are occupied by the medical and surgical patients promiscuously. The patients seem to be in a large proportion of good constitution and temperate habits. The more dangerous diseases, viz., "fevers and all infectious or contagious diseases," are excluded.

Surgical operations are not very numerous. [*See the list of operations below.*] In 1862 39 operations were performed, including the minor ones, as talipes, nævus, hydrocele, amputations of fingers, &c. There appears to be a good proportion of children with slight surgical affections (talipes, nævus, harelip, &c.) The cases remain in the house a considerable time, a recommendation being good for three months, at the expiration of which time it may be renewed. The patients have a generous diet. The wounds are carefully dressed in a simple manner, and cleansed with tow, cotton wool, or linen rag, which is then thrown away, sponges not being in use in the wards.

All these particulars must be allowed to be in favour of the recovery of the patients treated in the house. On the other hand, there are certain facts which seem to show that there are causes at work of an opposite tendency; since the prevalence of secondary hospital affections is very considerable.

There were no cases at all of these affections, as far as the recollection of the surgeons goes, from 1840 (when the hospital was built) up to 1854. Since then surgical erysipelas has been frequent, and has occasionally spread in the wards. Hospital gangrene has prevailed once only since the establishment of the hospital, lasting then from 6 to 12 months, and being finally removed by careful isolation of the patients. Pyæmia has been somewhat prevalent since this invasion of gangrene, but has gradually become more and more infrequent, and only one case has occurred during the last 12 months.

There have been less than 12 cases of fever in the hospital since its establishment; most of these were admitted with the fever existing; three or four cases have broken out during the residence of the patients. Two or three cases were scarlatina, and the others, of a typhoid type. Fever has never spread among the patients.

In inquiring into the causes of these affections, several sufficient reasons were stated to us by the authorities of the hospital.

In the first place, the hospital is constructed on a plan which is confessedly bad, there being no provision for the general ventilation of the hospital, nor any sufficient provision for the ventilation of the wards*, which have windows on one side only and

* These remarks apply to the old building, *i.e.*, the part now in use.

at each end, and in which the hospital odour is perceptible when there are bad cases in the ward. Ventilating holes have been made in the wards, and ventilating panes fixed in the windows, but these seem inadequate to replace the thorough ventilation by opposite windows. Then the water-closets are, as it were, almost a part of the ward itself, opening directly out of it. The drainage also has been, up to a very late period, defective, and perhaps may be so still, in spite of recent improvements. This defect is connected with the general system of drainage of the town, and many attempts have been made by the hospital authorities to counteract it, but up to a very recent period, at least in certain states of the wind, the bad air from the drains was blown back, and could be plainly smelt in the building.

Such unhealthiness, then, as can be charged to the account of this hospital, in which it appears vain to deny that some hospital (that is to say preventible) diseases do break out, appears chargeable to errors in the construction and drainage of the hospital.*

In three years the number of admissions given in the report is 1031, and the number of deaths 64, a proportion of 6·2 per cent., which, probably, is somewhat under the real proportion, inasmuch as re-entries of the same patient are most likely counted for two patients.

The account of the operations of the selected classes performed in the two years 1860–1861 is as follows:—

		No.	Died.
Amputation of the thigh,	for injury	3	1
" "	for disease	12	—
" leg,	for injury	3	—
" "	for disease	3	—
" arm,	for injury	1	—
" "	for disease	1	—
" forearm,	for injury	2	—
Exeision of the knee		1	(Died 18 months after of phthisis.)
" ankle		2	—
Lithotomy		3	1

We subjoin the statistics of certain operations for a period of 15 years, which appear to show a very favourable result for pathological amputations, particularly those of the thigh.

STATISTICS OF OPERATIONS from 1840 to 1854.

Table of all the amputations of limbs consequent on accident.

	No.	Recoveries.	Deaths.
Thigh	7	2	5
Leg and ankle joint	4	3	1
Arm	4	4	—
Forearm	3	1	2
	18	10	8

Of the eight deaths, three were due to the shock of the accident and operation, three died of pyæmia, one of profuse suppuration, and one of hospital gangrene.

Table of all the amputations of limbs consequent on disease during the same period.

	No.	Recoveries.	Deaths.
Thigh	32	30	2
Leg and ankle joint	7	7	—
Arm	5	3	2
Forearm	5	4	1
	49	44	5

The five deaths are thus accounted for:—pyæmia one, phlebitis with pyæmia one, hospital gangrene two, tetanus one.

	No.	Recoveries.	Deaths.
Lithotomy	29	28	1

Out of 18 deaths occurring in the year 1862, 11 were on the surgical side; 9 were the direct result of accident, (complicated in two cases by primary amputation); one was due to hydrocephalus, and in the other the cause given, "ulcer of the leg," renders it possible that some hospital disease might have intervened. Of the seven medical deaths, one only (erysipelas) could be attributed to acute and curable disease.

As to the cases in the house at one visit, we find that on 25th November 1863 there were 57 patients in 68 beds; rather an unusual number of vacancies. Of these six only were medical patients, and only one of these was labouring under acute disease.

Of the cases of surgery, 18 were accidents, including 10 simple and one compound fracture; 12 were cases of acute disease, including 2 cases of erysipelas, which broke out in the hospital, [it was noticed that though the two patients were in different wards they were attended by the same nurse,] one of phagedæna, and one of diffuse inflammation of the cellular tissue occurring before admission; 21 were chronic surgical affections. No operations of the classes selected were at that time in the hospital. The number of open wounds was 26.

T. H.

* To the errors above enumerated ought perhaps to be added that the beds are somewhat too near together.

ROYAL PORTSMOUTH, PORTSEA, AND GOSPORT HOSPITAL.—This is a hospital of modern construction, having been opened for the reception of patients in 1849. It consists of two parts; a general hospital supported by private charity, and a female Lock hospital supported by government. The latter department contains 28 beds; the former 33. There are several wards empty for want of funds.

The hospital is irregularly built, and has a great resemblance to a large private house. The wards are mere chambers, none of them having any thorough ventilation, and the largest being of such an irregular shape, and so interrupted by a large bulkhead, that no through ventilation would be possible. The beds are very close together, and the amount of cubic space must be limited. The rooms are not found to be properly sweet unless the windows are opened. The drainage also is imperfect, the soil from the water-closets being received into cesspools a short distance from the house. This inconvenience is perceptible in summer time.

The letter system is strictly adhered to in this institution, with its usual results, viz., that the few beds which are all that the funds of the charity allow are for the most part occupied by chronic invalids, many of whom, if not all, would be as well at home; whilst acute cases of disease are thereby excluded. The small number of beds which are kept up are not very full, the average number occupied being about 50. At the time of our visit there were 50 patients in hospital; 29 in the general hospital, and 21 in the Lock wards. All the cases in the former were chronic, with the exception of four or five accidents, one of which had been complicated with erysipelas previous to admission. With respect to the Lock wards, they are, perhaps, the best in the house, and the cases seem to do well; all the arrangements here and in other parts of the hospital for cleanliness being very perfect. The defect of this part of the establishment is, that when the arrival of a fleet in the port gives a prospect of gain in their trade, many of the women insist on leaving before their cure is complete. The only remedy is to refuse admission to such persons in future.

With respect to the success of practice at hospitals like these, it is very hard to judge. Surgical operations are said to do very well, and probably they really do so; but the records are not perfect. We discovered in the hospital register the account of—

9 cases of lithotomy, all in children (the oldest 10), of which one was fatal.
4 operations for strangulated hernia, and 2 deaths.

Amputations of thigh,	for injury	-	2	-	1 died.
" "	for disease	-	2	-	—
" leg,	for injury	-	6	-	1 died.
" "	for disease	-	2	-	—
" arm,	for injury	-	3	-	1 died.
" forearm,	for disease	-	1	-	—
	Total	-	16 amputations, 11 primary, of which 3 died (all primary).		

The above list cannot be said to be a very correct one, since it does not include by any means all of the operations performed in the period (five years) over which the record extends; but it is an unselected series of cases, and may therefore be conjectured to afford an approximation to the truth.

The deaths seem to be due to chronic visceral disease, or to the direct effect of accident, in so large a proportion of cases, that it is impossible to estimate the effect of treatment on the small per-centage of acute affections remaining. The death-rate in the year 1862 was 3·04.

It may be stated that one severe outbreak of erysipelas has occurred in the accident ward here, proving fatal in several cases; but that, with this exception, secondary affections seem rare.

We endeavoured to estimate the period of treatment of simple fractures of the leg and of the thigh at this institution, and found it to be on an average 55½ days for the femur and 35½ for the leg.

On a general review of this hospital, it is difficult to avoid a feeling of very great regret at seeing an institution which might be made useful in rescuing from death the victims of acute disease and severe injury, who must be so numerous in a crowded busy town like Portsmouth, used mainly as a refuge for a few chronic invalids, who have had the good luck to recommend themselves to some subscriber to the charity. We may put aside the government institution for the reception of diseased prostitutes, which is under the same roof as the hospital, but forms no integral part of it, and we need give no opinion in this place either as to the wisdom or to the efficiency of such an establishment. The Lock hospital, however, could be at any time separated from the other, and the beds so set free turned to the purposes of the main institution. The hospital accommodation for the whole of the great town included under the names of Portsmouth, Portsea, Southsea, Gosport, and Landport, and containing an aggregate population in 1861 of 94,828, consists of 33 beds, and these are devoted almost entirely to the reception of patients who, whatever the gravity of their affections may be, are in no danger of immediate death. All this time there is a large out-patient department of the hospital itself, and a branch dispensary at Gosport, from which patients are seen at their own homes, and from either or both of these establishments plenty of cases might be selected to fill this very small number of beds with patients whom such a removal might in many cases rescue from death, and in others from a chronic condition of illness.

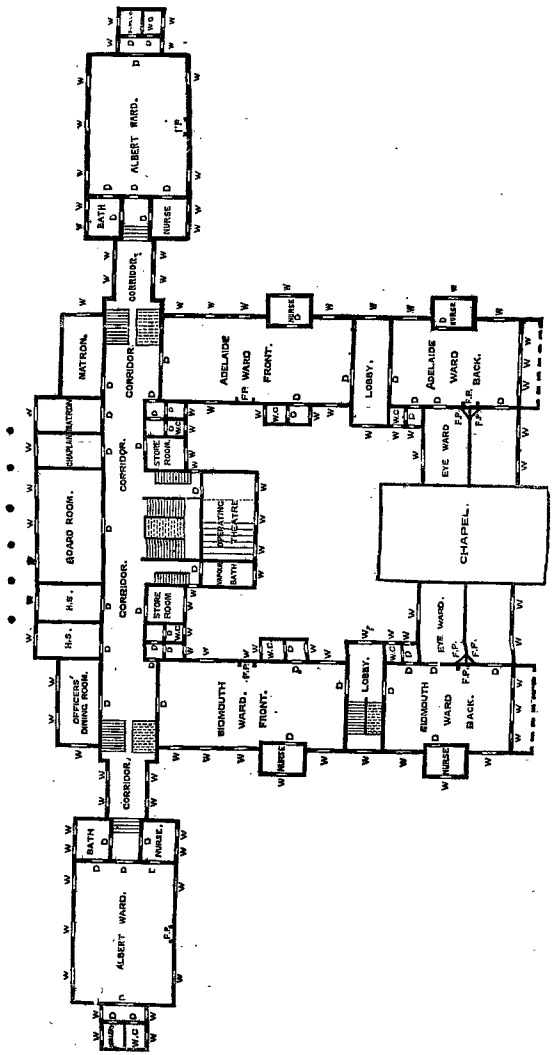
T. H.

THE BERKSHIRE COUNTY HOSPITAL AT READING is situated in a rapidly increasing and thriving town, which has become a great centre for railway traffic, and which appears to be very healthy, being peculiarly free from fever. There has been, however, a good deal of small-pox lately.

The hospital stands on the outskirts of the town, in four acres of ground, of which a large portion is used for the patients' exercise, and the rest for garden. It looks into the open country on three sides. The building consists of a hollow square and two wings. The ground and first floor of the sides of the square and the first floor of the wings are used as wards. The front of the square has a central corridor running from end to end, and terminating in the wards of the wings. Thus the part used for hospital purposes is like the letter H in shape, except that the upper parts of the long limbs have been, as it were, folded back. The main principle, however, of the hospital construction, is that of the H shaped hospitals; viz. that the wards are exposed on both sides to the outer air, and the corridor is used for access, not for ventilation. Another departure from this plan of building has also been made, in blocking up the fourth side of the square by means of a chapel, connected to the side limbs of the H by portions used as eye wards. This addition to the original building is both unsightly and appears deleterious to the construction of the building, both as obstructing the entrance of air to the inner side of some of the wards, and as obliterating altogether the windows on on one side of some others (see the plan). Otherwise the wards are built on an extremely good plan, being ventilated by opposite windows and fire-places, with some means of accessory ventilation. The wards in the wings (which are new) are especially good, having ample cubic space, the beds well apart, and the arrangements for bath-room, nurse's room, and water-closets being of the most perfect description. Each has a dining or day room below it. On the whole there are 10 large wards (7 to 11 beds each) and 7 small wards, with 2 beds each, making a total of 107 beds (54 male, 53 female), of which on an average 80 are occupied daily. The amount of cubic space is about 1500 feet to each bed, being rather greater in the new than the old wards. The water-closets are seen on the plan to be all built outside the walls of the hospital (though not sufficiently separated from the wards, except in the new wings), and the drains go down from them outside the house to a large cesspool, which is trapped, and has a constant stream of water running through it. The supply of water to the hospital is unlimited, and all patients who can bear it have baths on admission. The admission is chiefly by letter weekly. Of 721 cases admitted in 1862 the number of accidents was 141, and of emergencies 48. Ordinary fevers are admitted (but, as above stated, there is little fever in the town), but the exanthemata and hooping-cough are excluded, as is also erysipelas; and if cases of erysipelas or of contagious diseases break out in the house accidentally, they are sent away. There is no strict separation between medical and surgical beds, but one ward on each side is reserved for accidents. The male patients are chiefly agricultural labourers; the females, domestic and farm servants. The hospital is served by 3 physicians and 3 surgeons. There is no strict time for visiting, but in general patients are seen most days before 3 o'clock. There are 6 day and 2 night nurses; they are assisted by scrubbers in cleaning the house. The method of treatment is described as chiefly stimulating and supporting; only one bleeding was remembered in the course of half a year; viz., in a case of fractured ribs. The method of dressing wounds is by light dressing with cold lotions. Sponges are used in cleansing wounds. The floors in the old wards are scrubbed; in the new wards they are polished and dry rubbed. The latter wards are confessedly healthier than the former, but then their space and general arrangements are also better. Patients who do not do well are often sent from the old wards into the new. The mattresses are of horsehair, and are cleaned periodically. This precaution was, it appears, neglected about two years ago, and at the same time an outbreak of erysipelas occurred, in which 28 patients altogether were attacked, but none died. The disease subsided upon stricter attention to cleanliness having been enforced, and it has not since appeared. During the half year for which we could get positive information, only one case of erysipelas had shown itself in the hospital. The patient according to rule was sent home. One case of pyæmia had occurred. The patient was believed to have had the disease before admission. The number of patients admitted in 1862 was 731; 260 medical and 471 surgical. Most of the diseases are chronic, both on the medical and surgical side, but some cases of fever, pneumonia, &c. occur, together with a fair proportion of serious accidents. At the time of visit there were 83 patients in the hospital, 29 of whom were medical. Of these, 3 only were grave or acute; the others chronic or trivial. Of the 54 surgical cases, 16 were accidents. Many of these were trifling injuries (at least not involving danger to life) of the hand or eye. They included 1 compound *fracture*, 5 simple fractures, and 3 burns or scalds; 8 were classed as acute diseases, including one amputation of the thigh for disease, and one case of doubtful phagedæna occurring in hospital; 30 were chronic cases. There were 17 open wounds or sores; many of them slight.

The annexed list will show the number and the success of the operations of the kinds selected for comparison for three years, 1860, 1861, and 1862.

	No.	Died.
Amputation of thigh for injury	2	1
" " disease	11	2
" leg for injury	4	1
" " disease	2	—
" arm for injury	2	(1 at shoulder joint).
" forearm for injury	7	1
" " disease	1	—



BERKSHIRE COUNTY HOSPITAL, READING.—First Floor.

	No.	Died.
Excision of hip for disease	2	2
„ knee for injury	1	—
„ „ disease	2	—
Lithotomy, adult	2	—
„ child	1	—
Hernia	4	1

The causes of death, as far as we have had the opportunity of analysing them, show that the practice of the hospital is what would be expected from the above facts. In 1862 there were 32 deaths (4·3 per cent.) Of these, 13 were medical, 6 from acute disease (typhoid fever, pneumonia 2, puerperal fever, puerperal peritonitis, peritonitis), the rest from visceral disease (in which phthisis does not occur; the disease in an advanced stage is excluded by rule, and this rule seems pretty well observed); and 19 surgical; 7 from the direct result of accident; 6 after surgical operations; 2 trephining the skull; 1 amputation of thigh; 1 operation for strangulated hernia; 1 excision of hip; 1 section of femur for ankylosis; the others from miscellaneous causes.

On a review of this hospital we should say that it is a strictly "country" hospital, of good construction in the main, well managed, with rules for admission somewhat more liberal than those of country hospitals in general, and therefore with a rather larger proportion of acute cases than those hospitals from which all fevers are excluded. Operations are pretty common, and appear to be about as successful as in London, but not decidedly more so. Hospital diseases are not common, but they are not unknown; and the extraordinary precautions taken against erysipelas show apparently that the hospital has suffered severely from that disease, as is testified also by the history of a late severe attack, which broke out apparently on very trifling provocation. It must not be forgotten, however, that neither the ventilation of some parts of the building, nor the arrangements for drainage, are by any means perfect. J. S. B. T. H.

SALISBURY.

SALISBURY INFIRMARY.—The hospital lies in the western portion of the town of Salisbury. The whole town is low, and the hospital itself is in one of its lowest parts. There are ample airing grounds, which are used by male and female patients at different hours.

The hospital consists of the old building, a square block of four floors, and of a new three-floored wing. The general arrangement of the old building is this:—It presents a central square hall of considerable dimensions, extending up to the roof, with staircases and landings around, and a skylight above, and with wards and other rooms surrounding it on all sides. The wards in this part of the house are eight in number, of which three are large and five small. The three large wards resemble one another exactly; they are 70 feet long, 21 feet wide, and 20 feet high; they contain 18 beds apiece, and the cubic space allowed to each bed is therefore a little more than 1600 feet. They have each six sash windows on one side, reaching about half the height of the wards; and at either end, above the entrance to the water closet on the one hand, and above the nurse's room on the other, is a window reaching to the ceiling. They are provided also with ventilators in the ceilings and in the floors, and in the walls opposite the windows. At one end they communicate by a double door with a water-closet and with a scullery, and at the opposite extremity with a nurse's room. Two of these wards, one placed over the other, occupy the whole of the building behind the central hall, extending completely from one side to the other; and the third, placed above the entrance, the chapel, and house surgeon's room, occupies a corresponding position in front. The remaining five wards are distributed in different parts of the building. They are small, low (from 10 to 12 feet high), vary in shape, have one or two windows each, and ventilators in floors and ceilings or walls, and contain five, three, two, three, and two beds each respectively. The number of beds is small in proportion to the size of the wards, so that the cubic space per bed varies from 1000 to over 2000 feet. In two of these wards the water-closet is merely a kind of cupboard in the ward, with external ventilation, it is true, and not offensive, but certainly badly placed.

In the new wing the number of wards is four, two being situated (back and front) on the first floor, and two similarly on the second floor, the arrangement and the dimensions of the wards being the same on both floors. The wards are lofty (15 feet high), have windows on three sides, and on the fourth side the entrance door on the one hand, and on the other hand a doorway opening into a lobby, which communicates with the water-closet. The back wards are only two thirds the size of the front wards, and contain a smaller number of beds. The cubic space per bed varies from 1200 to 1600 feet. There are ventilators in the ceiling.

The water-closets throughout the house are well drained, and, with the exception above given, are unobjectionable. There are no bath-rooms, but most of the larger wards have a portable bath, and a supply of hot and cold water laid on. Each patient is, if he can bear it, bathed on admission. There is an abundant supply of water from the water-works.

The floors are scrubbed once a week by the assistant nurses, and the hospital itself is emptied, cleansed, and whitewashed once a year. This annual cleansing was going on at the time of our visit, and hence several of the wards were empty. In the new wards the walls, up to a height of about 5 feet, are lined with Parian cement. The bedsteads are of iron, without posts or curtains. The bottom of the beds is in some cases made of sacking, in others of a lattice-work of iron, upon which cocoa-nut matting is laid. The

SALISBURY.

mattresses proper are of horse hair, and after bad cases are taken to pieces, and thoroughly cleansed.

There is a superintendent nurse, with four head nurses, three assistant nurses, a supernumerary nurse, and two night nurses, who live in the house, and are fed. The acting medical staff consists of one physician, three surgeons, and a resident house surgeon. The treatment on the whole is stimulant; depletion is employed very rarely; but antimony and mercury are in use in the treatment of inflammatory diseases. In the dressing of wounds, wire sutures, oiled lint, and sometimes water dressings are employed. Stumps are often strapped; and sometimes poulticed for two or three days after operation.

The majority of patients are admitted by letter, but accidents and urgent cases come in without. The following cases are excluded:—women big with child, children under seven (except in special cases), persons disordered in their senses or epileptic, persons suffering from infectious diseases, and all such as are manifestly dying or incurable. The greater number of patients come from the country districts around Salisbury, and consist in large proportion of agricultural labourers and of servants.

There are separate medical and surgical wards; an eye ward for men, a female venereal ward, and a separation ward.

The total number of beds in the hospital is 100, of which 54 are for males, 42 for females, and 4 indifferently for one or the other sex, and of which 36 are medical, 62 surgical, and 2 for either medical or surgical patients. The average number of patients in the house during the year ending 2d August 1862 was 77. At the time of visit the hospital (which was particularly empty) contained 46 patients only, of whom 33 were males and 13 females, and of whom 10 were suffering from medical and 36 from surgical affections.

Of the medical cases, one only was acute; this was a case admitted for hysteria, but in which typhoid fever had supervened since admission. There was also a case of diabetes, and one of albuminaria. Of the surgical cases, 7 were accidents, 4 were acute, and the remainder chronic; 16 had open wounds. Among the more important cases were, 1 of lithotomy, 3 of compound fracture, 1 of amputation of the thigh, and 1 of the foot for disease, all of which were doing well. There was a burn also in which the skull was exposed; and a case in which erysipelas had attacked a patient admitted into the hospital for ophthalmia.

During the year ending 2d August 1862, 1001 patients (of whom 149 were admitted as accidents or emergencies) were treated to a termination, and 23 (or 2·3 per cent.) died. The per-centage of deaths for 95 years is nearly the same, 2·9.

Of the 1001 cases 453 were medical, the remainder surgical. Of the medical cases, 15 were cases of fever or febricula, 1 was a case of apoplexy, 33 were cases of bronchitis, 46 of consumption, and 5 of pneumonia. There were 44 cases of heart disease, and 52 of rheumatism. Among trivial cases may be enumerated, 13 of hysteria, 48 of dyspepsia, 20 of leucorrhœa, and 43 of anæmia or debility. Of the surgical cases, 117 were accidents, including 8 burns and scalds, 81 simple fractures, 4 compound fractures of the arm and leg, 6 cases of concussion of the brain or spine, and one case of gunshot wound. There were also 3 cases of stone, 2 of hernia, and 7 of cancer of the breast. Among trivial cases, or cases not likely to be fatal, were 59 of venereal disease, 58 of affections of the eye, and 58 ulcers. The death-rate of medical cases was 3·3, of surgical cases 1·4, of accident cases 3·4, and of surgical cases (with accidents deducted) ·92. The death-rate of accident cases in 1850-61 was 5·5.

During a period of four years, the reports show the following operations in the classes selected for comparison. 11 amputations of the thigh (2 deaths), 11 of the leg (1 death from pyæmia), and 1 of the forearm. 1 excision of the hip-joint, which proved fatal, 1 of the ankle, and 2 of the elbow; 4 of hernia (1 death); 4 of lithotomy. A case of excision of half the lower jaw died of pyæmia.

Since the period to which the above report refers, a man was admitted with phlegmonous erysipelas of the leg, of which he died, and erysipelas spread into other wards; besides which, 6 persons (nurse, porter, house surgeon, &c.) were attacked with sore throats and feverishness, and several with labial herpes. 10 years or more ago there was a severe outbreak of erysipelas, and this disease had been common for years previously. The hospital was then much more crowded than at present, and the drainage was imperfect. 29 cases of erysipelas are recorded in the books of the hospital for 10 years ending July 1861, of which 8 were fatal.

It is clear from the above account that the nature of cases admitted, and their stay in the hospital, are very much determined by the rules of the hospital; that few acute medical cases gain admission; and that of chronic cases (such as phthisis) likely to prove fatal few are permitted to die in the house. The surgical accidents are tolerably numerous (forming, perhaps, about one fifth of the total surgical admissions), and they include a few severe cases. It is certain, however, that the greater number of surgical cases are like the medical, chronic. Still capital operations are decidedly not infrequent; but, judging from their character, we believe that that is rather due to the hospital having a local reputation for surgery than to any other cause. Operations on the whole appear to do well; but two cases of death from pyæmia are recorded in the report for 1861–62. The low mortality of the institution is evidently due to the causes above assigned. The hospital is purely a country hospital, and, though far from being a model hospital, is clean, fairly ventilated, and well adapted to its purpose. J. S. B.

SHREWSBURY.

THE SALOP INFIRMARY is situated in the south-eastern part of Shrewsbury, and faces east and west. It stands on a very elevated site, at a short distance from the river Severn. The grounds which belong to the hospital are about an acre in extent; and

patients are allowed to take exercise on a terrace at the back of the hospital, overlooking the river.

The general plan of the building is on each floor that of a central corridor extending from end to end, with staircases, waterclosets, and windows at each extremity, and with wards symmetrically arranged back and front along its whole length.

Including basement and garret, the hospital presents five floors, of which the three highest are devoted almost exclusively, and the ground floor partially, to patients. The latter floor contains two wards, the dispensary, the out-patient department, &c. The kitchens, and so on, occupy the basement.

The wards are 19 in number. There are three small wards; two of them operation wards with two beds each, one on either side of the operating theatre, and one an eye ward with three beds. All the others have, as nearly as possible, the same dimensions, and (with the exception of two accident wards on the ground floor, which hold 7 beds each) are made to contain eight beds apiece. The height of the wards on the ground floor, and on the first floor, is about 12 feet, on the second floor 11 feet 8 in., and in the garret 14 feet. The other dimensions of all the wards are within a few inches the same, viz., about 30 feet by 20; and hence in the wards with eight beds each the cubic space allotted to each bed is about 900 feet, and in the accident wards it is about 1000.

The corridors are large and well ventilated. As regards the wards, 12 of them, which occupy the corners of the building, have windows on two adjoining sides; the remainder have them on one side only. The windows are generally sash-windows, of good dimensions, and each has one ventilating pane. Besides windows, there are, for the purposes of ventilation, perforated zinc plates in the panels of the doors, and ventilators, either in the walls or the ceilings, communicating with the corridors, the chimneys, or direct with the external atmosphere. All the wards were without ill smell, and seemed well ventilated. Open fire-places and gas are in use. The wards are scrubbed once a week by the under nurses and patients, and the hospital cleansed thoroughly once in two years. The walls are painted half-way up, and coloured above. The hospital was clean at the time of our visit. The bedsteads are of iron, and only those for eye cases have curtains. Hair-beds are used throughout the house, and in the accident wards there are straw mattresses as well. After bad cases, or after being damaged in any way, the beds are pulled to pieces and cleansed.

There are eight water-closets for the use of patients. They are well away from the wards, have plenty of water, and are without offensive smell. The closets of different floors are over one another, and have (besides windows) for each vertical series a common ventilating shaft. One part of the house is thoroughly well drained, but the other is drained by a brick drain which frequently becomes defective. The drinking water of the establishment comes from a well, and is said to be good. Water for other purposes is laid on from the river. There are baths on the first and second floors, and patients are bathed, as a rule, on admission.

There are (it must be added) two dayrooms, one for men and one for women; the latter being also the operating theatre.

The nursing is performed by nine persons, of whom eight live on the premises. There is a nurse to the accident wards, one to the garret wards, a nurse with two assistants to each of the other floors, and a night nurse. The medical staff comprises three physicians, an equal number of surgeons, and a resident house surgeon and his assistant.

In respect of medical treatment, it seems that general bleeding is never performed, but that moderate depletion in other ways is frequently had recourse to. Stimulants are also used in moderation. Water dressing is the ordinary application to wounds.

Patients are admitted by subscribers' letters once a week. Accidents and other urgent cases are admitted without such recommendation. About one third of the cases are of the latter description. The following cases are excluded:—women in the family-way, children under seven (except in special cases), infectious diseases (typhoid cases occasionally admitted), and insane, epileptic, and incurable persons. There are wards for syphilitic patients. The applicants for admission are chiefly agricultural labourers, but there are also many domestic servants and navvies. About two thirds of those admitted came from without the town. An accident van is kept on the premises, but is rarely used.

The hospital contains 133 beds, of which 48 are medical and 85 surgical. 73 are for males, 56 for females, and 4 for one sex or the other, according to circumstances. Medical and surgical cases are separated; so also are syphilitic and eye patients. There are male accident wards, and two separation wards. The average number of patients in the house was 126 in 1861–62, and 113 in 1860–61, and the average length of stay was in the former year 44½ days.

At the time of visit there were 96 patients in the house, 58 male and 38 female, and 33 medical and 63 surgical. Of the medical cases, five were acute, namely, a case of typhoid, 3 cases of acute rheumatism, and one of erysipelas (where this disease had supervened upon some trivial affection during residence in hospital). Eight others were serious, and fit hospital cases, such as cases of heart disease, dropsy, and so on; but the rest seemed trivial or chronic. Of the 63 surgical cases, 10 were cases of accident, 5 were acute, the rest chronic or unimportant. Among the above were included several simple fractures, a burn, a case of suppuration in the cellular tissue of the leg, the result of accident, a case of primary amputation of the thigh, and three cases of primary amputation of the leg. There were about 21 open sores.

During the year ending 24th June 1862 1080 cases were admitted, and 41 (or 3·98 per cent.) died. In the year before that there were 970 admissions, and 48 (or 4·9 per cent.)

deaths. And in the year immediately preceding the last the admissions were 946, and the deaths 53, or 5·6 per cent. The records of cases are not kept in an available form, so that the exact proportions of medical and surgical cases are not known, nor could we ascertain with accuracy the nature of the diseases admitted. It is stated that there are a considerable number of accidents, more particularly of railway accidents, but that, with this exception, medical and surgical cases are for the most part chronic. The nature of cases admitted, may be gathered to a certain extent from the records of death. Thus it appears that of the 41 deaths occurring in the year 1861-62, 18 were surgical, and that of these 13 were due directly or indirectly to accidents. The remainder were medical, and comprised one from fever, two from pneumonia, one from diphtheria, one from the sequelæ of scarlet fever, and one from peritonitis, two only from phthisis, and the rest from chronic affections (for the most part) of the heart, kidneys, &c.

ENGLISH RURAL HOSPITALS

SHREWSBURY.

In 1862 the following capital operations of the selected classes were performed:—three amputations of the thigh, with two deaths (one from pyæmia); four amputations of the leg and three of the foot; two amputations of the hand and three of the arm; and one for strangulated hernia. There were also six cases of lithotomy, of which one was fatal. In the first eight months of 1863, 18 capital operations were performed, of which four were amputations of the thigh (two fatal and one convalescent, but not yet cured), five amputations of the leg, one of the foot, one of the upper arm, one of the forearm, and two excisions of the elbow. Two cases of lithotomy had been performed, and a fatal case of herniotomy.

From March to June of the present year (1863) many cases of erysipelas broke out in the hospital, chiefly among the surgical cases, but in two instances in medical patients. Altogether 12 or 15 such cases occurred; several were affected seriously, and one died. At the same time there was a good deal of phagedæna, and one death from pyæmia. There have been also occasional outbreaks of erysipelas in former years. The late attack was supposed to depend on defect of drainage, which was remedied.

This hospital must be regarded as a country hospital. It is fairly situated, and not badly constructed. The mortality is low, but this evidently depends on the nature of the cases admitted. Few, except surgical accidents, appear to be serious cases, but of the latter the proportion appears to be pretty considerable. On the whole, operations seem to do well, but amputations of the thigh have been in the last two years not very successful. Two deaths from pyæmia have occurred within the last two years, and there has been lately (as above mentioned) an epidemic of erysipelas. There seems to be no spread of infectious medical diseases, and for a very good reason,—such cases are excluded.

J. S. B.

SOUTHAMPTON.

ROYAL SOUTH HANTS INFIRMARY, SOUTHAMPTON.—The infirmary at Southampton is very pleasantly situated on rising ground, commanding an extensive prospect; with spacious gardens for the patients' exercise, and broad pleasant verandahs on the first and second floors of the south face of the building, where they take the air in summer and exercise in wet weather. It is a very comfortable and appropriate abode for persons not labouring under acute disease, but for the purposes of a general hospital for acute ailments it is less perfectly fitted, on account of the limited provision for the thorough ventilation of the whole building, the small size of the wards, and the fact of the water-closets being contained in the wards themselves (separated by a boarding), instead of outside of them.

The cases, however, are mainly of the chronic nature. The beds are given away on the weekly admission system, and all fevers and infectious cases (including even common erysipelas) are, by rule, excluded from the hospital. This rule is in practice so far relaxed that cases of ordinary fever (whether typhus or typhoid) are admitted, provided there is no other case in the ward; but the beds are often retained for some time beforehand, and the practical effect is almost to exclude acute cases, except surgical accidents. Thus in the report for 1862 it is stated that only 10 cases of fever were admitted in the year 1862. This, considering the great and rapid communication between Southampton and all foreign parts, shows that the hospital does not receive the number of acute cases which might be taken in if such were the intention of the governors.

The hospital is well filled. It has a greater number of beds than it was originally constructed to hold, but all these beds are filled. The building is only about 15 years old, and was destined for 65 beds, but there are now 72 in the hospital, and the average of patients is 70. The cubic space per bed is ample, being on an average 1585 feet in the male wards and 1175 in the female. The patients are either of the seafaring class (including engineers, &c.) or of the labouring. The former are usually, or commonly, of dissipated habits; while the latter are steady and simple in their way of living. This difference has been observed by the medical officers here to tell upon the results of treatment.

With regard to the results of treatment, it appears that hospital secondary diseases are rare, as from the nature of the practice of the hospital might be anticipated. A very few cases of sporadic erysipelas occasionally occur, but the disease does not spread in the wards. It is thought by the medical officers to be usually (if not always) caused by some bad condition of the ward itself, on which being remedied it disappears. Phagedæna appears unknown here. Pyæmia, however, is moderately common, 4 deaths out of 25 in 1862 being attributed to it. It may be noticed that the deaths here show a larger proportion of deaths from acute disease than at most country hospitals. The death-rate over all the cases in the year 1862 was 3·8. In the year 1862, the admissions were 328 medical and 335 surgical patients. At the time of visit there were 67 patients in the house. Of these 25 were medical; four of them suffering from acute disease.

Of the surgical cases, 42 in number, 13 were accidents, comprising 1 burn, 2 compound and 6 simple fractures; 3 were acute, and 26 chronic diseases. Of the operations selected for comparison there were two, a case of herniotomy and one of primary amputation of the thigh. The number of open sores was 16.

With reference to the surgical operations selected for comparisons we are favoured with the following statement:—

Extract from Statistics of Operations at the Royal South Hants Infirmary, Southampton, for three consecutive years.

AMPUTATIONS.*

	No.	Died.
high for injury	2	2
„ disease	3	1
eg for injury	3	2
„ disease	3	1
rm for disease	—	—
„ injury	2	1
ore-arm for injury	2	—
„ disease	1	—
xcision of elbow	1	—

Lithotomy above the Age of 15 years.—None.

Under the Age of 15 years.—Three. All did well. No deaths

Strangulated femoral hernia.—One. Cured. J. S. B. T. H.

STAFFORD.

STAFFORD GENERAL INFIRMARY.—This hospital is situated towards the outskirts of the town, and the back looks out directly upon the country. It stands on three or four acres of ground, and has a large garden behind, to which patients have free access.

The general plan of the hospital is somewhat irregular. It seems to have consisted originally of a central building of four floors (including basement), to which have been subsequently added, in the first instance, two symmetrical wings of three floors, and lastly a fever house, also of three floors, adjoining the right wing. The latter may be regarded as a distinct hospital, as its plan is quite different from that of the rest of the building, and it is almost completely shut off from it.

The basement of the general hospital is used for domestic purposes and for out-patients. On the ground floor there are 3 wards, with 5, 8, and 9 beds each. On the first floor, which is entirely devoted to patients, there are 7 wards, with 11, 12, 10, 9, 9, 4, and 2 beds respectively; and on the attic floor are two wards (a male and female syphilitic), holding 4 and 6 beds respectively.

The first floor may be taken as giving a general notion of the arrangement of the house. In the centre (over the entrance hall and other parts) is a largish ward, extending from back to front, with windows at both extremities. The ward has a door on each side leading out into a lobby, adjoining which are the sleeping rooms of officials, and a staircase. On either side a rather complicated series of passages and lobbies is prolonged hence, and these communicate with three smaller wards, one in front and two behind, of which two have windows on two contiguous sides. At the opposite ends of the building, and nearly symmetrically placed, are the water-closets, bath-rooms, and lavatories.

The wards are generally small, but tolerably lofty. The walls are coloured; the floors are oiled and dry-rubbed. The windows in some cases open by sashes; in other cases the upper portion revolves horizontally. In some of the wards there are ventilators communicating with the chimneys, but they do not appear to answer. There are open fireplaces, and the wards are lighted by gas.

In the fever house there is a separate staircase at one end, and a corridor on each of the upper two floors, running along the whole length of the front of the building and terminating in a water-closet. Four small rooms open out of each corridor behind, of which two on each floor are for nurses and two for wards. Each ward contains four beds. The floors of the fever wards are scrubbed. The arrangements as to ventilation, heating, and lighting are the same here as in the principal building.

The water-closets generally are well drained (drained into the river). They are well supplied with water, free from smell, and separated from the wards. There are two bath-rooms in the general hospital, and one on the basement floor of the fever house. Patients are bathed on admission. Water is supplied by a well on the premises; it is abundant, and said to be good.

The general ventilation of the hospital seems to us to be decidedly defective. The corridors and lobbies are certainly peculiarly close, and most of the wards have a deficient supply of windows, both in respect of size and number. The wards generally smelt close. The beds too, in many instances, were much too near one another. The bedsteads are of iron, without curtains, and each is provided with a straw mattress and a horsehair bed. These are periodically pulled to pieces and cleansed, and generally after any bad

* MEM.—In the amputations of the thigh for injury, of those that died, one of the patients was a publican, a very hard drinker, and affected with kidney disease. The other lost an enormous quantity of blood before admission, no tourniquet having been applied, and he never rallied from the shock. His accident was occasioned by a railway train passing over him. In the amputations of the leg for injury, of those that died one was severely injured, and he was brought a distance of seven miles bleeding all the way.

The somewhat large mortality is therefore accounted for—

1st. By the severity of the accidents.

2d. By the great loss of blood.

3d. By pre-existing organic disease.

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STAFFORD.

case. The wards are cleansed weekly by the nurses, with the assistance of the patients; and the whole hospital is thoroughly purified once a year.

There are three head nurses and five assistant nurses resident in the house. Of these one nurse and one assistant have charge of the fever wards. One of the assistant nurses acts as a night nurse.

There are three physicians and three surgeons, who divide the hospital duties between them; and a house surgeon, together with a resident dispenser.

The treatment of patients does not go to an extreme, either as regards stimulation or depletion; but bleeding is never practised. Water dressing is used as a local application; tow alone is used in the cleansing of wounds in the wards, and sponges at operations.

Accidents alone are admitted without letter. All other cases (including urgent medical cases) must be recommended, and Friday at noon is the time for their admission. Fever cases and cases of primary syphilis are admitted into special wards. Incurable or dying cases are excluded; as also cases of itch, epilepsy, lunacy, women advanced in pregnancy, and, except in special instances, children under seven. The applicants for admission are chiefly shoemakers, agricultural and other labourers, domestic servants, &c. During harvest time applicants are very few. About one third come from town; the remainder from the country districts around.

There is no separation of diseases in the hospital beyond that mentioned above; ordinary medical and surgical cases are mixed together.

The hospital contains 105 beds, of which 79 are for surgical or ordinary medical cases, 16 for fever, and 10 for syphilis. 59 of the beds are for males, 46 for females. The average number of beds occupied in 1862 was 70.

At the time of visit the hospital was clean. It contained 46 patients, of whom 27 were males. 19 females; and of whom 20 (including 1 suffering from typhus and 2 from typhoid) were medical, and 26 (including 2 syphilitic cases) were surgical. Of the 17 general medical cases, 2 cases of Bright's disease, 1 of cancer of the stomach, and 4 of phthisis constituted all that could be regarded as of any severity; the remainder being almost without exception trivial cases. Of the 24 general surgical cases, 3 were cases of simple fracture, 4 others (including a case of phlegmonous erysipelas, and one of amputation of the hand,) might be regarded as acute, and the remainder were chronic or unimportant. There were 10 cases with open sores.

The majority of cases admitted into the hospital are medical, and these (with the exception of fever cases) are almost wholly chronic. Accidents are not numerous, and therefore the greater proportion of the surgical cases are chronic also.

In the year 1862, 661 cases were admitted into the hospital, of whom 50 (or 7·5 per cent.) died. 52 of the above number were admitted into the fever wards, and of these 13 (or 25 per cent.) died. Excluding from computation the fever cases, the per-centage mortality of the house was 6· only.

In the year 1861, 570 cases were admitted, of whom 28 (or 4·9 per cent.) died. Of these 26 only were fever cases, but of these 5 (or 19·2 per cent.) died.

On analysing the causes of death for the year 1862 (the record, however, is extremely imperfect), we find that, in addition to the fever deaths, there were 3 deaths from burns, 3 from compound fractures, and 1 from hernia, but not more than one or two others that belonged to surgery; by far the greater number were medical.

The record of operations is also very imperfect. Of the operations chosen for comparison, there were in the year 1862, 2 cases of amputation of the fore-arm for injury, 1 of amputation of the thigh for disease, 4 of amputation of the leg (2 for disease and 2 for injury), and 1 of excision of the elbow. Of these the result in several instances is not given, but the 2 cases of amputation of the leg for injury died. Again in 1863, up to the end of July, five such operations appear to have been performed, viz., 1 of excision of the knee, 1 of Pirogoff's operation, and 3 of amputation (1 of the upper and 1 of the lower arm for accident, and 1 of the leg for disease). None appears to have been fatal.

It is asserted that secondary diseases are rare. Post mortem examinations are only occasionally made.

The hospital seems to occupy a healthy site, and in many other respects is good, but it evidently labours under faults of construction and of ventilation which would probably render a more frequented hospital liable to outbreaks of hospital diseases. Such diseases would seem to be uncommon here, but it must be recollected that the surgical practice is limited, and, moreover, post mortem examinations are rarely made, and no very good records are preserved.

J. S. B.

TAUNTON.

TAUNTON AND SOMERSET HOSPITAL.—The hospital is situated in East Reach, to the east of and on the borders of the town. It lies low, and has houses on both sides, but has an open prospect both behind and in front. There is about an acre of ground at the back of the hospital, to which patients have access at stated times.

The hospital is symmetrical in form, and consists of a central portion and two wings; the former old, the latter new. The old portion of the building has, with the basement, four floors. The ground floor, which may be taken as a type of the rest of the building, presents a broad corridor, extending through its whole breadth; arranged along the front of which are, in the centre, the entrance hall, and on either side offices and other rooms. Projecting from the back of the corridor at each extremity are staircases, and in the centre a large room; but intermediately the wall of the corridor forms part of the outer wall of the building, and has windows in it for light and ventilation. This portion of the hospital contains only four wards; two on the first floor and two on the second. Of

the wards on the first floor, the larger is a male surgical ward, and contains eight beds; the smaller is a female medical, and holds five beds. Of those on the second floor, one contains five the other four beds; they are both male surgical wards, and receive eye patients.

The wings consist of three floors (including the basement), and of these the ground and first floors are entirely devoted to the reception of patients. The wards are four in number (two in each wing), and exactly alike in all respects, except that the two on the first floor are rather lower than those on the ground floor. They are long, broad, and lofty; communicate near the centre of one side with the extremity of the corridor of the central building, and opposite to this have, built out, a nurse's room and a lavatory.

The wards in the old building are low, and have windows on one side only; but the wards in the wings are lofty, and have windows at both ends and on one side. The windows are sash-windows, and, in the new wards especially, seem ample for ventilation; but ventilation is aided by the insertion into the upper part of all the doors of plates of perforated zinc, and in the wing-wards by ventilators in the ceiling over nearly every window. The wards are heated by open fire-places and lighted by gas. The cubic space allowed to each bed in the large wards varies from 1100 to 1200 feet; in the smaller wards it is considerably less; but the beds themselves appeared to be generally a good deal too close to one another. The water-closets of the large wards are good and well drained, and are separated from the wards by a lobby. Those of the older building are less satisfactory. The drainage and water supply are both excellent. There are two bath rooms (one for males and one for females) on the first floor, and a douche and shower bath in the basement.

The wards are scrubbed once a week by scrubbers, and the hospital has been hitherto cleansed and whitewashed once a year; but in future this is to be done twice annually. The bedsteads are of iron, with wooden heads, but without curtains. The beds are of flock, but hair mattresses are in use for fracture cases. After bad cases they are pulled to pieces and cleansed.

There are five day nurses, who live in the house, and three non-resident night nurses, of whom one only is on duty at a time. The staff consists of two physicians, three surgeons, and a house surgeon. The medicines are made up by a dispenser.

The treatment adopted is decidedly stimulating. Wounds are chiefly treated with water dressing, and in cleansing them tow alone is used; sponges have been discontinued since the middle of 1862.

The applicants for admission are chiefly agricultural labourers and domestic servants (one out of three of the females who are admitted belong to the latter class). The remainder consist of artisans and small tradespeople. About one-third come from the town; the rest from the villages and country districts round about. Patients are admitted by subscribers' letters, those coming in as casualties forming a very small minority. Thus, out of 740 cases admitted in 1862, 66 only were casualties; and out of 753 in 1861, 44 only were casualties. The cases which are excluded are cases of mania, epilepsy, infectious diseases (typhoid is occasionally admitted), women advanced in pregnancy, and (except for operation) children under seven. Syphilis is also excluded by rule, but cases of this disease are admitted.

The hospital contains 90 beds, of which 39 are for medical cases and 51 for surgical, and of which 51 are for males, 39 for females.

At the time of visit the hospital was clean and well ventilated, and contained 66 patients, of whom 39 were males, 27 females, and of whom half were medical, half surgical. Of the medical cases, about 10 were or had been either acute or of a serious character. These included two cases of acute rheumatism, two of typhoid, one of scarlatinal dropsy, and one of convalescence from pneumonia. Of the surgical cases, 10 might be regarded as of an acute or serious character, and among these were four cases of simple fracture, two of compound fracture of the leg, a case of convalescence from herniotomy, and one of convalescence from ovariotomy.

The hospital records show that the average number of patients in the hospital during the year ending October 1862 was 77. During the same year the reports assert that 806 cases were admitted, but of these 80 (having remained over two months) were counted as two patients, hence the actual number of patients admitted seems to have been 726; 17 deaths occurred, producing a per-centage mortality of 2·3. During the year ending 25th October 1860 the number of cases actually admitted was 532, and 26 died, giving a percentage mortality of 4·8. From the foundation of the hospital 14,446 cases have been treated in the hospital, and 447 have died, giving a per-centage of 3·0 deaths. But the per-centage is doubtless a good deal below the real per-centage; for there is good reason to believe that the number, 14,446, includes a large proportion of patients who, from having been in the hospital over two months, have been reckoned twice over. Among the cases admitted during the year 1862 we observed one of scarlet fever, four of diphtheria, and six of typhoid fever, four cases of erysipelas, four of acute and 21 of chronic rheumatism, four cases of pneumonia, three of pleurisy, and a large number of cases (71) of phthisis and of scrofula (57), and a large number of such diseases as hysteria, dyspepsia, and so on. Of surgical complaints, we observed two of traumatic tetanus, two of hernia, one of vesical calculus, one of burn, 39 cases of fracture (including one of compound fracture of the leg), and two of concussion, besides 46 cases of ulcer, 32 of diseased joints, 45 of diseases of the eye, and 31 of skin diseases.

Of the 17 fatal cases occurring during the year, two were cases of cancer, four of phthisis, two of Bright's disease, two of diseases of the spinal cord, one of diabetes, and one of senile gangrene. One person died of shock after amputation of the leg for

laceration, one of compound fracture of the leg, one of tetanus after amputation of the fore-arm, one of pyæmia after caries of the frontal bone, and one of extravasation of urine.

Of operations selected for comparison performed during the year we find two of amputation of the thigh (one on account of compound fracture of the leg proved fatal from shock, the other on account of gangrene after deligation of the femoral artery proved fatal from spread of gangrene), two of Teale's amputation of the leg, and one of amputation of the upper arm for disease (all three did well), and one of amputation of the forearm for accident (this proved fatal from the supervention of tetanus). A case of lithotomy did well. There were no operations for hernia.

Medical cases we were informed are nearly all chronic, and so also are surgical. Accidents are not very numerous.

ENGLISH RURAL HOSPITALS.

TAUNTON.

In the year 1861, during about six months, 46 cases of erysipelas occurred in the house, all the surgical wards partaking in the outbreak. Nearly all cases of operation were attacked with it, and two proved fatal. Erysipelas was common in the town at the same time. No pyæmia occurred then.

This hospital is a purely country hospital, and the nature of the cases admitted is doubtless greatly influenced by the mode of admission. The new wards are exceedingly good wards but it is important to note the prevalence in them, for a time, of erysipelas.

J. S. B.

WHITEHAVEN.

WHITEHAVEN HOSPITAL.—Whitehaven is a seaport town in Cumberland, and the hospital connected with it lies to the south west, on the borders of the town. It lies, with almost the whole of Whitehaven, in a valley, and there are houses and manufactories round about it, but in no other respect is it unhealthily situated. The airing grounds attached to it are small.

It consists of two distinct parts. The first is an old three-storied building, facing the street, which formed the original hospital, but which now, as a place for the reception of patients, has fallen almost entirely into disuse. On the upper floor are two rooms which can be used as wards, but have not been so used for seven years; and on the first floor there are, besides other rooms, three wards, two at the front and one at the back, which are small, low, fairly ventilated by windows on one side and ventilators leading into the passage, and contain respectively 4, 4, and 2 beds. One of the larger ones is used for male accidents. The other two are male or female, according to circumstances. Besides these there are over an archway at the side of the house two small wards with two beds each, for such cases as small-pox, syphilis, &c.

The new hospital consists of a long block of buildings projecting backwards at right angles from the old building into the grounds belonging to the institution. It consists (including the basement) of three floors, of which the upper two are used for wards. The anterior and larger portion of this building is used for ordinary medical and surgical cases, and is approached from the house in front. The hinder part, which has a separate entrance, is devoted entirely to the reception of fever cases. In the anterior portion there are two wards containing 10 beds apiece, one on the first floor for men, and one on the second floor for women. They are long, broad, and lofty, and allow of at least 1500 cubic feet of space to each bed. They are lighted and ventilated by numerous opposite windows, by an open fire-place, and by a door, (with a ventilating hole above) at each end. The windows consist of three horizontal sections, of which the upper one revolves on its transverse axis: the other two are ordinary sashes. On either side of the narrow passage leading to each ward is a small room; that on the one side being the bath-room, that on the opposite side being subdivided into a scullery and water-closet. The door at the opposite extremity of the ward leads through a lobby to a large library and day-room for the use of the patients; and on either side also of this lobby are rooms, one the nurse's room, the other containing, well separated from the wards, water-closets.

The posterior fever portion of the new hospital comprises (like the other portion) two wards, one on each floor, for men and women respectively. These wards are of the same height as the others, but somewhat squarer; moreover they have windows at the end as well as at the sides. In other respects the wards themselves are pretty nearly exactly like those above described. They contain 10 beds apiece, and allow at least 1500 cubic feet to each bed. The staircase and entrance to these wards are from the side, and at the back of the staircase and landing are the nurse's room, the bath-room, and the water-closet, the first only communicating directly with the wards.

The floors are of ordinary deal, and are scrubbed by the nurses, aided by a charwoman, once a month. The walls of all the new wards are of stucco, and have a rather dingy if not dirty aspect. They are not cleansed annually; indeed the fever wards, which are the latest additions, have not been thoroughly cleansed since their erection, now five years ago. The bedsteads are of iron, without curtains, and far apart. The mattresses for the fever wards are of straw, and are frequently emptied. Those for the other wards are of flock or horse-hair.

There is no artificial heating. The water-closets and bath-rooms are good. The town, however, is altogether badly drained. Water supply is abundant and good, and is laid on to the house.

The nurses live on the premises, but provide their own meals; one attends on the ordinary male cases, another on the ordinary female cases, and the third takes charge of the fever house. Extra nurses are sometimes employed.

There are five acting medical officers to the institution, who take duty in rotation for a month at a time, and during that time take charge of all patients, medical and surgical. There is also a resident medical officer.

Water dressing is employed in the wards. Stimulants are used largely; depletion rarely, if ever.

As regards rules for admission, fever cases and accidents are admitted whenever they apply (and as the house surgeon attends, on behalf of the hospital, a large number of poor people at their own homes, cases of the former kind are likely to be admitted in large proportion); other cases are admitted by governors' letters. Patients are brought to the hospital either on "sick beds" or in an ambulance belonging to the hospital. Patients admitted are, as a rule, *not* paupers, but mechanics, agricultural labourers, sailors, and (when paid for) domestic servants.

Almost all kinds of disease are admitted. Incurable cases, however, such as phthisis, and syphilis in its primary form, are by rule excluded. Small-pox too is rarely admitted.

The hospital contains 54 beds, of which 40 are in the new building and 14 in the old. Of the former, half are for males, half are for females; one half for fever cases, the other half for ordinary medical and for surgical cases. Of the beds in the old building, four are for male surgical cases; but the other beds are comparatively rarely used, and receive males or females, as the case may be, suffering from syphilis, from small-pox, or other affections which require to be separated.

At the time of our visit there were 19 men and 12 women in the house. Of these, 22 were suffering from typhoid fever (which disease at the time was raging in the town) 8 being placed in the ordinary wards. There were no other medical cases. The 9 surgical cases comprised 2 cases of burn from gunpowder, a case of injury to the spine, one of fractured thigh, a case of enormous cancerous tumour of the thigh, one of abscess of the knee, and 3 cases of a trivial character.

The number of fever cases admitted varies very greatly in different years, and when they are admitted in large proportion the mortality of the hospital is necessarily greatly increased. Other medical cases are generally not very important. The surgical admissions include a moderate number of accidents, but otherwise are not generally of a serious nature. Operations are not numerous. The average number of patients in the house during 1862 was 16 only.

In the year 1862, 197 cases were admitted, and 18 died. 67 were admitted as urgent cases, the rest on governors' recommendations. 65 of the cases were fever cases, of which 9 died. The remainder include 7 burns, of which 2 were fatal, 5 concussions, of which 2 were fatal, and 19 fractures and dislocations, o which one was fatal. There was 1 operation of the classes selected in the year, viz., a case of herniotomy. The per-centage of deaths for the year was 9 1; the per-centage of deaths in fever cases 14·0.

In the year 1861 there were 142 admissions and 10 deaths, a per-centage of 7·0. But there were only 10 cases of fever admitted, and not one was fatal. Two of the deaths were due to burns, 2 to fracture of the skull, one to a fractured leg (compound, doubtless), and one occurred after an operation on the shoulder joint. This seems to have been the only operation of any importance.

In 1860, 125 cases were admitted, and 15 (or 12 per cent.) died. 5 of the admissions were fever cases. Of the deaths 3 were in cases of burns, one in a case of strangulated hernia, one in a case of fever, and the rest in cases of chronic disease. There seem to have been 2 operations in the year, one being for strangulated hernia.

In the first eight months of the present year (1863) 247 cases have been admitted, but of these 156 were cases of fever (all or nearly all probably typhoid), and of the latter number 15 (or 9·6) have died.

Erysipelas, pyæmia, and the like, originating in the hospital, are, we are informed, very rare; but it must not be forgotten that operations are not numerous, and that post-mortem examinations are rarely made.

The hospital in most respects must be regarded as a country hospital, but it is in a seaport town, and in a town which cannot be regarded as being in anything like a satisfactory sanitary condition. Judging from the average number of patients in the house, and from the annual admissions for some years, it would seem that the hospital has little pressure upon it; yet the mortality is high. There is nothing whatever to show, however, that the mortality is dependent in the least degree on unhealthy hospital conditions; rather the reverse. It must be referred, therefore, chiefly to the nature of the cases admitted. And the fact that a large proportion (though really a small number) of accidents is admitted; that the house surgeon attends at their own homes a large number of poor people; and that the medical officers of the hospital are engaged in large general practice, are brought into constant contact with the poor, and meet, in the course of their duties with those cases which are most appropriate for admission,—these facts, it seems to us, tend to explain the heaviness of the mortality of the institution.

J. S. B.

WINCHESTER.

HANTS COUNTY HOSPITAL, WINCHESTER.—This hospital is in Parchment Street, in a low-lying part of the town. There is an open space at the back, used by patients as an airing ground.

The building, the greater part of which is old, has three stories (including ground floor), the main entrance being on the first floor. It consists of a central portion and two wings. The former is divided transversely by a corridor, which communicates with the entrance hall, and contains three staircases, the committee room, and a variety of rooms not used for patients. The wings, one on either side, are comparatively long and narrow, and form, with the central part, a continuous straight line. At the extremity of

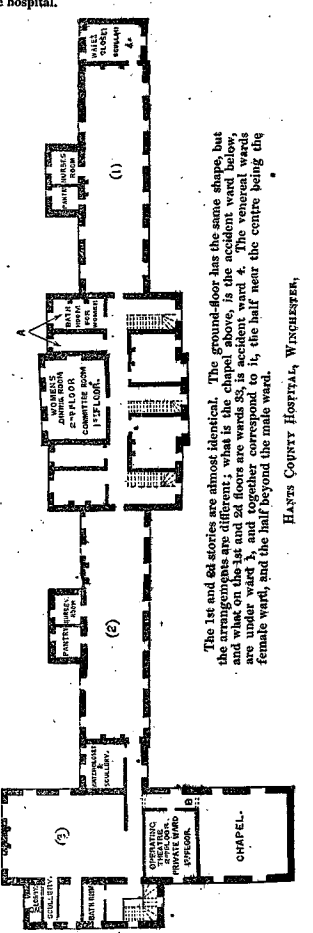
the right wing an addition has been made, which consists in a building placed at right angles to it in such a manner that both behind and in front it extends for some little distance beyond the general line of the hospital.

In each of the two *symmetrical* wings there are two wards, one on *each floor, occupying (with a* scullery at the end, and with a nurse's room and pantry built out behind,) the whole area of the wing. These wards are long, narrow, and of moderate height; they contain from 15 to 16 beds apiece, and allow a cubic space of from 860 to 920 feet per bed, but the beds are too close. They have numerous opposite sash windows, and ventilators in the floors for the admission of air from without, and in the ceilings for the escape of foul air. The walls are whitewashed; the floors are old and in bad condition. There are two wards on the ground floor, under the right wing, which, together, correspond in size to the single ward above; one of them is for male, the other for female syphilitic patients. These wards are intended to hold six patients *each*. They are low, have small dark windows, and water-closets opening directly out of them. The cubic space per bed is from 800 to 900 feet.

The newest part of the hospital is divided transversely by corridors prolonged from the wards in the right wing, and has rooms placed in back and in front. All the space behind the corridors forms on each floor one ward. Each of these wards is nearly square, has windows on two contiguous sides (opening by sashes, and in some instances provided with hopper-mouthed ventilators), the entrance door on a third side, and on the fourth side doors leading to scullery, water-closet, &c. Ventilation is aided by ventilators in the upper part of the walls. The floors are better than in the old building, and the walls are painted. The wards contain from 9 to 10 beds apiece, and a cubic capacity per bed of about 1000 feet. On the first floor there is also a small side ward for one bed, and on the ground floor a ward with six beds.

All the wards are heated by open fire-places, and lighted by oil-lamps, but the corridors are supplied with gas. Every patient is, except he be too ill, bathed on admission. There is a bath-room on each of the upper floors, and two for the venereal wards. Water is abundant, but hard; it is laid on from the waterworks.

The water-closets themselves are for the most part removed from the wards, well constructed, and without any offensive odour; but those connected with the venereal wards open directly into them; and that belonging to the female venereal patients has no ventilation whatever except through the ward. The whole town of Winchester lies low, and hence scarcely any part of it is drained. The hospital shares in this defect; but to remedy it a large cesspool, capable of containing at least 11,250 gallons, has been constructed in the hospital grounds, not far to the rear of the hospital, to which all the drains of the building converge. Prior to a report by Mr. Raw-



The 1st and 2d stories are almost identical. The ground-floor has the same shape, but the arrangements are different; what is the chapel above, is the accident ward below; and what on the 1st and 2d floors are wards 33, is accident ward 4. The venereal wards are under ward 3, and together correspond to it, the half near the centre being the female ward, and the half beyond the male ward.

HANTS COUNTY HOSPITAL, WINCHESTER.

linson, in January 1861, this was a cesspool of the ordinary construction, and without an overflow; but subsequently to his report the cesspool was emptied, an overflow pipe was connected with it, and its surface (measuring 20 feet by 15 feet) was covered with a vulcanized zinc grating, over which was placed a layer of vegetable charcoal 13 inches thick. Further, every drain pipe, just as it emerges from the house, has been replaced, to a small extent, in its upper part, by a zinc grating, with several inches of charcoal above it. The result has been excellent. The water-closets, which used to be very offensive, have ever since been free from ill odour; and no trace whatever of ill smell is perceptible even in the neighbourhood of the large cesspool.

The wards are scrubbed once a week by scrubbers; and the entire hospital is emptied, whitewashed, and fumigated once a year. Most of the bedsteads are of iron, but they vary in their form. The mattresses are flock, and in some cases of the husk of oat. After infectious or offensive cases they are taken to pieces, and thoroughly cleansed.

There are day-rooms for the patients on each floor.

There are seven day nurses distributed throughout the hospital, and four night nurses. The medical staff consists of two physicians, three surgeons, and a resident house surgeon. The medical treatment is very various, as also is the surgical. Ointments, lotions, and abundant dressings are not wholly discarded; but water dressing is chiefly employed. As regards diet, it may be remarked that many patients are put on "special diet," the nature of which is determined by the matron and nurse from day to day.

Patients are admitted by letter once a week. This rule practically excludes acute cases, as is shown by the fact that in the year 1860–61, 95 cases of emergency only were admitted, and in the year 1861–62, 98. Patients come chiefly from the surrounding country and villages, and consist chiefly of agricultural labourers. Servants in place are admitted on payment of 1s. per day. The cases which are excluded by rule are cases of phthisis and epilepsy, cases of infectious disease, patients dying or incurable, those who are disordered in intellect, women advanced in pregnancy, and (except in special cases) children under seven. Venereal cases are admitted, but females with the disease rarely apply. Surgical, medical, and venereal cases are separated from one another.

The hospital contains 111 beds, of which 64 are for males, 47 for females, and of which 78 are surgical, 32 medical, and one for cases requiring separation. 12 of the surgical beds are for venereal cases. The average number of patients in the house was (for the year 1861–62) 73.

At the time of visit the hospital contained 60 patients, of whom 30 were males, 30 females; and of whom 23 were suffering from medical complaints and 37 from surgical. Of the medical cases, 4 were acute, but of these 2 only were in any degree severe, viz., a case of pneumonia and one of bronchitis. The remainder were chronic, and comprised several cases of phthisis and of other organic diseases. The 37 surgical cases were equally trivial. Three only were acute (comprising two operations for epithelioma), and one only was an accident (namely, a smashed foot, in which gangrene had taken place). All the rest (including 6 venereal cases) were chronic. There were many cases of ulcerated leg. Altogether there were 12 open sores.

The records of cases admitted, and of surgical operations, are not preserved. But it appears that in the year ending June 1862, 788 cases were admitted, and 18 (or 2·28 per cent.) died; and that in the year immediately preceding the number of admissions was 727, and the deaths 32 (or 4·4 per cent.), an unusually high mortality for the hospital. In the former year, 5 of the deaths were in surgical cases, and comprised two from pyæmia (one after application of a blister and one supervening on ulcer of the leg), 2 from strangulated hernia, and one from cancer of the bladder. The remaining deaths were in medical cases, and comprised three only from acute diseases, viz., one from rheumatic fever, one from pneumonia, and one from diphtheria.

The hospital appears to have been regarded for some years as an unhealthy one, and for two or three years it has been in contemplation to dispose of the site, and to re-erect the hospital at a distance from the town. The discussions which have arisen have produced numerous letters and statements from those who have been anxious to retain the hospital in its present position, and from those who have wished to see it removed. It seems to be generally allowed by both sides that, notwithstanding the annual per-centage mortality of the hospital is extremely low (ranging generally between 2 and 3 per cent.), erysipelas is not uncommonly developed in the hospital to a serious extent, and fever has, on more than one occasion, broken out in it. This is the more remarkable, because infectious cases are not admitted, and accidents and operation cases are few and far between. As regards fever, it is stated by Mr. H. S. Lyford, that there was an alarming outbreak in 1835, when numerous inmates of the hospital were attacked, and the house surgeon and porter died. The disease was supposed to have depended on the presence of a poisonous sewer under the dispensary, which was effectually removed. The disease was probably typhoid fever. In reference to erysipelas, a table has been drawn up by the house surgeon (Mr. Langdon), in which he has incorporated from the register of deaths all those deaths (during a period of 13 years) which appear to have been caused by secondary diseases. It appears from this report that in the period specified 22 patients suffering primarily from other affections died of fever, and that 24, also labouring under other complaints, were carried off by erysipelas (7 being operation cases). Again, 2 deaths are said to have been caused by pyæmia, 4 by gangrene, and 1 by hospital gangrene. But although there can be no doubt that the above enumeration proves the existence from time to time in the hospital of an atmosphere affecting injuriously the patients admitted, it must not be forgotten that these statistics have been obtained for a purpose; that of the great majority of cases brought together nothing whatever is known beyond the bare

statement given in the record of death; that it is reasonable to assume that some of the cases were admitted for the complication which caused death; and, lastly, that there is internal evidence that the terms typhus, typhoid, low fever, and fever have been loosely used in the register, and consequently, in many instances, simply imply that the patient died with what are called "typhoid" symptoms. There are other statistics, however, which are more trustworthy. Thus, it appears that in the year ending June 1861 (the year before quoted, in which the mortality was unusually high,) 25 cases of erysipelas broke out in the hospital, and that 9 deaths resulted from it. In 10 cases erysipelas attacked a wound made in operation; in 6 it originated (without wound) in the head and face; and in the remainder it attacked old ulcers and sores.

ENGLISH RURAL HOSPITALS.

WINCHESTER.

This hospital is certainly a purely country hospital, both from its locality and from the class of cases admitted. The patients are chiefly agricultural labourers; few serious accidents apply; the rules exclude infectious diseases and cases in which death is threatening (practically, therefore, most acute and urgent diseases); and the patients admitted are for the most part suffering from unimportant affections, or at least from affections not likely to prove fatal. It is important, therefore, to observe, that the diseases of town hospitals prevail here, and that erysipelas is not only not infrequent but that it is peculiarly fatal. The hospital has, we believe, been decidedly more healthy since the change was made in its drainage; and there can be little doubt that offensive drains and water-closets had much to do with the production of disease in it. But in seeking for the causes of the unhealthiness of this institution, we must not overlook the defective condition of the floors, which renders it impossible to cleanse them thoroughly, and the closeness of the beds. It should be added that typhoid fever is common in the town.

J. S. B. T. H.

WOLVERHAMPTON.

SOUTH STAFFORDSHIRE GENERAL HOSPITAL, WOLVERHAMPTON.—The hospital is situated within the town, in close proximity with manufactories, but on one of the highest sites. It stands on between two and three acres, to nearly the whole of which patients have access at all reasonable times.

The form of the hospital resembles to some extent that of the letter H, but the wings are comparatively very short. It consists of four floors (including basement and attic). The basement is used for domestic offices; the attics for nurses' sleeping apartments. The ground floor has only two wards, the rest of the floor being used for out-patients, matron, and house surgeon's rooms, &c. The first floor is devoted entirely to the reception of patients. The hospital is built on the corridor plan; and presents on the first floor (which may be taken as a type of the rest of the building) a corridor, extending from one end to the other of the central building. The wards of the central building are situated along the back and front of the corridor, and those in the wings at either end of it. The corridors on the ground and first floors are broad, lofty, clean, and well ventilated, and communicate with one another by large openings, railed round, in the floor of the upper one. The lower of the two is heated in cold weather by hot-water pipes. There are 12 wards and three day rooms. Of the latter, one is on the ground floor and two are on the first floor, one of the latter being also the operating theatre. Two of the wards are on the ground floor and 10 on the first floor. They are lofty, with coloured walls, whitewashed ceilings, and oaken floors, which (in nearly every case) are oiled and waxed and dry-rubbed. They vary very considerably in size, some being rather small, most of moderate dimensions, and one or two perhaps tolerably large. The two wards on the ground floor, which are accident wards, contain 17 and 4 beds respectively. Those on the first floor hold respectively 18, 14, 11, 10, 10, 7, 6, 6, 3, and 1 beds. The two largest wards, which occupy the wings, have numerous windows along one side, and one window at one extremity of the ward; but all the others have necessarily windows on one side only. The windows are large, open by sashes, and occasionally are provided with ventilating panes. The wards have also ventilators a little above the floor, for the admission of air from without, and ventilators either just below the ceiling or in the ceiling itself, which communicate by channels with a central shaft, in which a fire is kept burning for the purpose of creating a draught. The wards are heated by open fire-places only; the corridors, as before mentioned, by hot-water pipes. Gas is used for lighting. The water-closets are well drained, abundantly supplied with water, and without any offensive smell; they are well removed from the wards. Patients, as a rule, are bathed on admission. There are five baths in the house for the use of patients.

The bedsteads are of iron; those for medical cases alone have posts and curtains. There are a straw mattress and a hair bed to each bedstead, and these are cleansed and purified periodically and frequently. The wards are cleaned by the under nurses. The hospital is turned out thoroughly two or three times a year; but whitewashing is done rarely.

There are 10 nurses who live in the house; 3 upper nurses, 6 under nurses, and a night nurse. The latter attends exclusively to the male accident wards, but an under nurse sits up every night in rotation to take charge of the other patients.

There is one physician (at present) and three surgeons, who see out-patients daily in the morning, and afterwards visit the patients in the house. There is also a house surgeon and an assistant house surgeon.

In the treatment of patients stimulants are not used largely; bleeding is rarely had recourse to. On the whole, the treatment is a medium one. After operations dry dressings are ordinarily used for a day or two, and after that wafer dressings.

All patients, except those suffering from accident, and urgent medical cases, are admitted by letter. The number of patients in the house is in fact regulated in a very remarkable degree by the issue of governors' letters. Thus in the first six months of the year, when governors are flush of letters, there are often 90 patients in the house at one time; and so also in the last two months of the year, when it becomes important to use those letters which have been held in reserve. But during the intermediate four or five months, when governors begin to grow careful in the issue of letters, the numbers fall off considerably. The only cases excluded by rule are cases of insanity, women advanced in pregnancy, and incurable cases. All infectious diseases and syphilis are admitted. Applicants for admission consist chiefly of persons engaged in iron and coal works, such as iron smelting, mining, and so on. Few agricultural labourers or domestic servants are received. Patients come from Wolverhampton and from the manufacturing villages for 12 miles round.

The hospital contains 107 beds, of which 10 are for children. 60 (more or less) of the beds are surgical, 40 (more or less) medical, and the 10 for children are either medical or surgical. Medical and surgical cases are as much as possible separated. Syphilitic cases are mixed with other cases, and cases of fever, should they apply, would be placed in the general medical wards. Up to four years ago the children's ward and one below it were set apart for fever cases, but so few applied that it was thought needless to retain the wards for that purpose. Any infectious case is placed in a private ward.

At the time of visit the hospital appeared to be clean, well ventilated, and sweet; it contained 45 cases, of which 31 were males, 14 females; and of which 18 were medical, 27 surgical. Of the 18 medical cases, several were acute, viz., a case of scarlet fever, one of typhoid, one of acute rheumatism, and one of tubercular peritonitis; two or three others were cases of gravity, and comprised one of abdominal cancer in a child, and one of diabetes. Of the 27 surgical cases, 12 were chronic; of the rest, which might be regarded as acute, 13 were cases of accident (including 3 burns, 2 simple fractures, and 5 compound fractures). There were 3 cases of amputation (2 for accident and 1 pathological); and 2 cases of erysipelas, 1 supervening on a burn and one on an injury to the ankle. Including ulcers and burns, there were about 16 cases in which open wounds existed. Not one of the wards contained its full complement of patients.

The average number of beds daily occupied were, during 1862, 58; during 1861, 63; and during 1860, 65. In the year 1862, 546 cases were admitted, of which 154 were medical (18 being admitted as urgencies), and 392 were surgical (226 being accidents and urgent cases). Of the total number, 51 (or 9·3 per cent.) died. The mortality strikes one as being high, especially for a hospital which on the average has little more than half its available beds occupied; and in which, moreover, a comparatively small number of medical cases are admitted, and these including scarcely any fever or other very acute cases. The heavy mortality, however, is clearly due to the comparatively large proportion of serious accidents admitted; for it appears from the report that of the 51 deaths, 12 occurred in medical cases (7·7 per cent.); 4 only in the surgical cases admitted by letter (2·4 per cent.); and no less than 31 (13·7 per cent.) in the surgical cases admitted without letter. Of the deaths in medical cases, 2 were due to chronic pneumonia, 1 to chorea, and the remainder solely to chronic organic diseases. Of the deaths in surgical cases, 13 were due to burns (1 had tetanus), 1 was due to falling into a vat of acid, 4 were due to injury to the head, 4 to severe injuries (such as a smash), 6 to compound fractures (1 had pyæmia, 1 had the leg, and 1 the arm amputated); 1 was the result of cut-throat, 1 was after amputation of the hand, 1 after lithotomy, and 4 only from actual disease.

In the year 1861, 649 cases were admitted, 257 medical and 392 surgical; and 33 died, 15 medical and 28 surgical; the per-centage being on the whole number 5·8, and on the medical and on the surgical cases separately exactly the same. In the year 1860 the total admissions were 609, of which 256 were medical and 353 surgical. The deaths were 50, 17 being medical and 33 surgical; and the per-centage of mortality was 8·2 on the total number, 6·6 on the medical cases, and 9·4 on the surgical cases.

Secondary diseases we are informed are uncommon. Within the last four years one or two instances have occurred in which (during a certain period) operation wounds became sloughy, but no death resulted therefrom. About 12 months since 3 deaths from pyæmia occurred; but 2 of the cases had the disease probably on admission. The health of officials is good.

This hospital is in some respects a town hospital, being situated in a smoky manufacturing town, but it has, nevertheless, many of the characteristics of those hospitals which we have designated rural. It seems well arranged and ventilated; the beds are somewhat close to one another; but any evil which might result from this circumstance is doubtless neutralised by the small average number of inmates. J. S. B.

WORCESTER INFIRMARY.—The infirmary at Worcester is pleasantly situated, on the outskirts of the city, in a large open space, about a quarter of a mile from the river, and has ample grounds in front and at the back, used for the patients' exercise. The rules of the hospital are like those of country hospitals in general, that is to say, the patients are admitted weekly by a subscriber's order, which gives almost a right to a bed, or on account of accident. The rules also exclude all fevers, and all diseases believed to be incurable. The effect of these rules is to restrict the practice of the hospital almost entirely to surgical accidents and chronic cases. The hospital appears to be on an average more full than institutions of this class usually are, the average

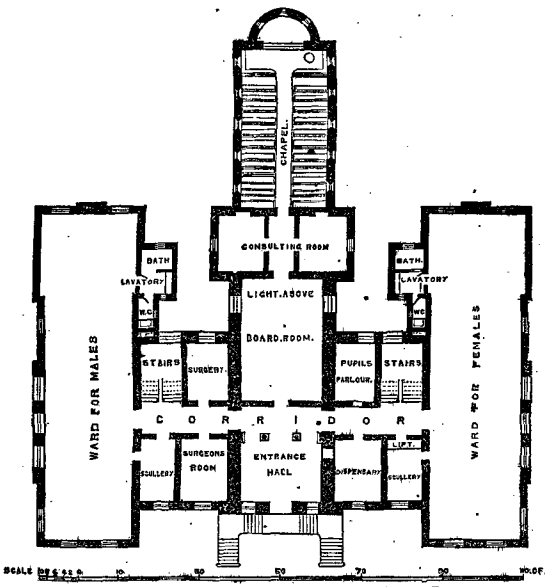
number of patients in the house, for a term of years, being 95, and the total number of beds only 101. It does not appear, however, that there is any increasing pressure upon the hospital, since in the past year, 1862, the average fell to 88½.

The results of practice in this hospital appear to be favourable at the present time, although no distinct records are kept by which this can be proved. The deaths in 1862 were 57, or 5·55 of the total number stated in the report (1,026). Out of these, one is unaccounted for, 11 were the direct result of accident, 24 of visceral diseases, 14 of various surgical affections, many of them probably acute, but not stated with sufficient definiteness for classification, 3 of acute medical disease, 3 after surgical operations (the proximate cause not given), and 2 of pyæmia, in one case with in the other without surgical operation.

Operations are said to do very well here, but there are no records kept by which that assertion can be tested, and it will be remarked that in the above list of deaths surgical operations bear quite their average proportion.

Secondary surgical affections are now rarely observed here. This used to be otherwise, erysipelas and phagedæna having at that time (about 10 years ago) been very prevalent, and as it seems fatal. This was attributed by the authorities of the hospital to three causes; defective ventilation, and perhaps overcrowding; the washing of the floors of the wards, which was believed to originate or favour the spread of erysipelas; and the use of sponges in dressing wounds, by which phagedæna was thought to be propagated. The hospital was accordingly remodelled. The wards were made more airy, and the beds placed further apart. The floors were relaid with oak boards, which are polished and dry rubbed, and the use of sponges in the wards was given up, wounds being washed with Condy's solution, diluted, and cleansed with tow, which is immediately thrown away.

The plan of the hospital is annexed; and from this it will be seen that the hospital, although of the H shape, is constructed on the corridor plan.



WORCESTER GENERAL INFIRMARY.—Ground Floor.

The wards are lofty and airy, and the beds have in most of the wards a clear space of 7 feet between them. In none of the wards are there opposite rows of windows, so that it has been found necessary to have artificial ventilation. This is effected by means of pipes leading directly from the outer air to gratings in the middle of the wards,

WORCESTER.

slightly raised in a dome shape above the floor. At the time of visit, which was made in fine warm weather, there was a very perceptible current of air passing into the ward. There are numerous holes in the walls near the ceilings, communicating with the outer air, by which the foul air is meant to pass off. The cubic space per bed is about 1330 feet.

From this description the second floor or garret wards must be excluded. They are extremely low, small, and dark, and are recognized to be unfit for hospital purposes. They will probably soon be altered. At present they are used chiefly for eye cases and chronic affections. Phagedæna seems to have affected these wards since the alterations.

The polished floors in this hospital form a very agreeable feature in it to the eye of a stranger, and are liked by the residents in the hospital. They are so highly polished that it would appear likely that accidents would result to people unaccustomed to walk on polished floors, especially to those on crutches, but no such drawback has been experienced. The labour of keeping them in order appears to be less after the first process than that of washing. Whether they have any effect in preventing or checking erysipelas is not shown by the experience of this hospital, since, coincident with their introduction, other and more important changes were made. *

Medical and surgical patients are not separated in different wards, though the medical cases, which are the minority, are kept together as much as possible. Cases of secondary affection (erysipelas, &c.) are not isolated.

At the time of visit there were 92 patients in the hospital, of whom 32 were medical; all chronic cases, or cases of chronic visceral disease, except two. Of the surgical cases (60), 15 were accidents, including 3 simple fractures, 2 compound fractures, and 4 burns or scalds; 7 were classed as acute, and 38 as chronic diseases. There were 2 operations of the classes selected for comparison, viz., 1 primary amputation of the thigh, and 1 primary amputation of the arm. There was one case of erysipelas arising in the hospital.

T. H.

YORK.

THE YORK COUNTY HOSPITAL does not differ, at present, in any very important particular from most English provincial hospitals. It is a well-constructed modern building, standing in the suburbs of the city, in a large piece of ground of its own, about seven acres, containing only 80 beds, and having ample accommodation for them.* The wards are double, with openings through the partitions, and each chief part has a smaller ward at the end. The larger hold 8 beds; the smaller 2. It is perhaps not the best form of ward, but it answers its purpose here, at any rate, where the cases are, as a rule, mild; great operations are not common (see the list below), and the hospital not crowded. Each entire ward contains 20 beds, and there are four such in the house, male and female, medical and surgical, so that the total number of beds is 80, but the average number of patients in three years was generally below 60, and never much above. The patients, again, are, in great proportion at least, agricultural people of quiet habits. All these causes would combine to render practice at this hospital successful, and so it appears now to be; but that which gives the history of the York hospital its value in our eyes is the proof it affords that hospital diseases are generated by the privation of fresh air, and the use of artificial systems to supersede windows and open fires, and the not less decided proof that such affections are removed by the opposite course of procedure.

When this hospital was erected, it was resolved that an apparatus should be used for heating and ventilating at the same time. The exact nature of this apparatus we have not been enabled to learn, nor perhaps is it necesary. It will suffice to say that the wards were not provided with fire-places†, and that the windows were mere glazed lights; they did not open, and in some cases were double. The warmth was supplied by means of a series of pipes which conveyed air from a reservoir in the basement, heated by passing over hot pipes, and driven into the wards by an engine; at the upper part of the wards were the openings of other pipes, by which the vitiated air was carried off, being in all probability "aspired," by being heated in a flue in the roof. This system remained in operation for several years, from about 1850-59. The wards were always close, sickly, and even offensive. The patients complained of the deprivation of fresh air, and the medical officers also complained of the state of the hospital. Worse than this, the health of the patients suffered, especially of those who were submitted to any operation, no matter how trifling. Pyæmia used to prevail at times; but erysipelas was the chief affection, and it continued on the increase, until at length operations, and even simple incisions, were so often followed by erysipelas, and this affection so often proved fatal, that the surgeon gave up operating altogether, and it is said chose rather to abandon their patients to the disease than risk operations which proved constantly fatal. At last the representations of the medical staff produced the abandonment of the artificial system. The hospital was emptied and thoroughly cleansed, fire-places were put in the wards, the windows made to open, and the natural means of heating and ventilation resorted to.‡ Since that period erysipelas has disappeared, only one case

* The wards were originally intended to accommodate a larger number of beds, but their number has been reduced so that each should have sufficient cubic space.

† Fortunately, in the original construction of the hospital, chimneys had been made, but when this scheme was adopted the chimneys were bricked up.

‡ The windows and fire-places are assisted by two shafts, which pass up from each ward into the roof, and are capped by cowls, one of which is made to turn from the wind and the other to it, so as to draw air out of the wards, and pass air into them; but it did not seem clear that this ventilation had any very marked effect; at any rate it was quite subordinate to the natural ventilation.

having originated in the hospital during three years. Pyæmia occurs only in very rare cases (two only were remembered), and operations do very well. These facts rest upon the authority of persons who were practising in the hospital during both periods, and who saw the difference effected by the change; but they cannot be exhibited in a statistical form, inasmuch as no records were kept of the cases of erysipelas which occurred, and the deaths which were really due to the intercurrent disease would be referred in the hospital register to that which was the original cause of the admission.

Out of 595 admissions in 1862, 102 were on account of accident, of which 8 died. Many of the accidents seem to have been slight, 42 being put down as contusions, and 15 as minor casualties. Acute medical affections were rare, pleurisy and pneumonia counting for only 5, of which one was fatal, and acute rheumatism 8, with no deaths. Half the whole number of deaths were due to phthisis and disease of the heart, 3 to acute surgical affections, including one case of pyæmia after operation, the rest chiefly to chronic visceral disease. The death-rate over all the cases was 6·5 per cent.

The number and result of the operations of the kind selected for comparison are given below for 3 years 1860, 1861, and 1862.

	No.	Died.
Amputation of thigh	5	1
„ leg	6	1
„ arm	4	—
Excision of hip	1	—
„ elbow	3	—
Strangulated hernia	3	3

At the time of visit there were 72 patients in the house; 24 were medical, of whom only 3 were suffering under acute disease; 48 were surgical, viz. 5 accidents, including 1 compound fracture, 1 simple fracture, and 1 burn; 10 were acute cases, including 1 amputation of the thigh for disease; 33 were chronic cases. There were 26 open wounds or sores.

J. S. B. T. H.

SCOTTISH HOSPITALS.

The ABERDEEN ROYAL INFIRMARY is attached to the University there. The numerous pupils of the University Medical School receive their whole practical education at this hospital.

The class of patients received here is said to be rather higher than that of ordinary hospital patients, the proportion of paupers and labourers being less in comparison to tradespeople, artisans, and domestic servants.

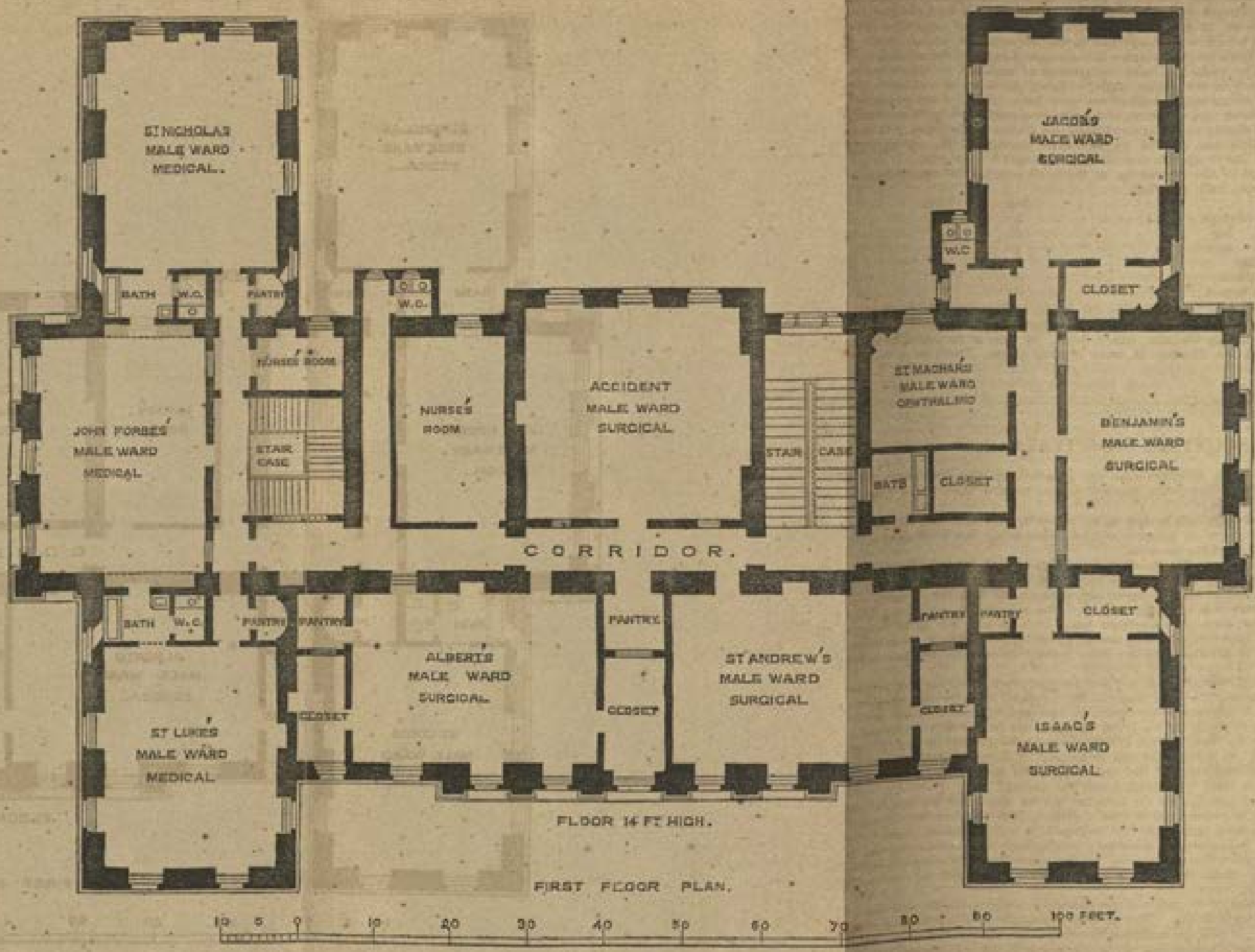
The cases admitted appear equal in importance to those which are to be found in the wards of most metropolitan hospitals, with the important exception that the proportion of accidents is lower, and that as there is never any pressure for beds, trivial cases gain admittance as well as those which are more urgent. The proportion in 1862 was 251 to 1,843 admissions. At the time of visit there were 13 accidents out of 75 surgical patients. In one respect, however, the cases are of greater gravity than in metropolitan hospitals, since small-pox is admitted into the fever house, which is not the case in any hospital in London.

The hospital contains 229 beds, allotted in equal proportions to medicine and surgery; viz., medical general hospital, 77; fever hospital, 38; surgical, 114; but the proportion of patients in the house is comparatively small, the average of beds occupied in 1862 being only 126·4, so that it would be no great exaggeration to say that the hospital is generally half empty. At the time of our visit there were 36 general medical patients, 13 fever, and 75 surgical. It seems that the proportion of surgical cases admitted is always greater than that of medical. In the year 1862, 1,080 surgical cases were in the house, and 892 medical; in 1861, 1181 surgical and 965 medical.

It may, perhaps, be worth notice, that the pressure on the charity of the hospital does not seem to be increasing, but rather the reverse; since in 1861 the number of patients admitted was 2,016, the highest number in the hospital 187, and the lowest number 104; while in 1862 only 1,843 patients were admitted; the highest number was 183, and the lowest 84. These figures show that during the two last years there have been never less than 40 empty beds in the house, and that this space has been greater on the medical than the surgical side of the house.

The surgical, medical, and fever patients are placed in separate wards, and those of the latter class in a detached building. The general arrangement of the hospital will be understood by the plans. It will be sufficient to remark on this head, that the central building, divided by the corridor running along its centre, is the old hospital, and the cross-pieces at the end are the wings added afterwards; and that only the latter enjoy the advantages of through ventilation by opposite windows; for as the corridors have little or no means of ventilation they rather impede than assist the purifying of the wards, in fact, are not perfectly free from foul smell. This difference in the construction of the wards has been observed by the surgeons to produce a difference in their salubrity; so that they do not like to put cases of operation into the central wards, if they can avoid it.

The surgical and medical wards afford a considerable difference in the contiguity of the beds. This is accompanied by a difference also in the cubic space per bed, also in



ABERDEEN ROYAL INFIRMARY.—FIRST.

(To face p. 684.)

favour of the surgical wards. Thus, comparing a surgical and medical ward, taken at random, we find 1,129 feet per bed in the former, and only 933 in the latter. It must be borne in mind, however, here as everywhere else, that the cubic space per bed is a very fallacious test of the real space per patient. Thus in the hospital before us, since neither surgical nor medical wards are, as a rule, ever full, and the medical wards less so than the surgical, it is clear that the above rather scanty allowance in theory may perhaps be converted into an abundant quantity in practice. It should also be recollected, in mitigation of the evils which the juxta-position of the beds in the medical wards would produce, that infectious cases are all placed in the fever wards.

In many other respects the arrangements of the hospital are excellent, the surgical wards especially, being very spacious, sweet, and cleanly. All secretions, dressings, &c. are immediately taken out of the ward, and the water-closets are built out of the building*, and have their drains also outside the walls of the hospital.

As to the results of the practice at the hospital, the annual report gives us unusually full information, although even here there is an omission which is much to be regretted, viz., that it gives no information as to the number and nature of the cases of secondary or hospital diseases occurring in patients admitted for other affections. In other respects the report seems to give a trustworthy idea of the state of the hospital, and of the classes of cases admitted. Of these we will select a few of the chief particulars, in order to give a general idea of the practice at this hospital. We find, then, from the report, that out of the total of 2,016 patients admitted in the year 1861, 277 were surgical accidents, comprising 75 simple and 4 compound fractures, and 48 burns and scalds. The class of affections of the respiratory organs, most of which are acute diseases, but which also includes phthisis, gives a total of 239 admitted during the year. The number of cases of phthisis was 71. The number of cases of fever (including common fevers, ague, scarlet fever, small-pox, and measles,) was 156. Thus it will be seen that there is a fair proportion of acute, and, again, a fair proportion of incurable medical disease, to account for a good deal of the mortality at this hospital. On the other hand, the number of cases of chronic disease, not threatening to life, is also large, skin diseases, syphilis, diseases of the eye and ear, and ulcers, counting for 355 in the admissions of the year. The list of deaths during the year may be thus subdivided.

Visceral diseases	52.	(Phthisis accounts for 21 of these).
Tumours and cancers	4.	
Acute medical cases	19.	
Fevers	18.	
Acute surgical disease and operations	15.	It must be observed that from the way in which the report is drawn up it is impossible to separate the diseases and injuries in this table from the operations which they require; but the account of operations will be given farther on.
Chronic affections	10.	
Injuries and operations	10.	
	128	

The total per-centage of deaths over all surgical cases seems to be about 1 in 42, and over all medical cases about 1 in 12, and the general death-rate of the hospital about 5 per cent.†

The verbal information which we obtained at the hospital on the subject of secondary hospital affections (on which head the annual report, as already noticed, is silent,) is, that the hospital is not much visited by them, that there is very little erysipelas, that phagedæna is not seen to originate in the hospital, and that pyæmia is rare.

These facts would quite coincide with what our experience seems to point to, on the subject of the causation of such complaints. 1. It has seemed to us that erysipelas has its main cause in dirt, putrefying materials and their exhalations, and confined stagnant air. As great attention is bestowed at this hospital in avoiding all such influences, we should expect that erysipelas would be of rare occurrence. 2. Phagedæna, as far as we have been able to observe, often originates in some unknown condition of atmosphere as its primary causes, and occurs epidemically in various parts of great cities and in various hospitals, but appears to owe its exciting causes in many or in most instances to neglect of cleanliness in dressing wounds, and especially (if we may credit our own impressions, fortified by those of the great majority of hospital officers,) to neglect in the cleanliness of the materials with which wounds are dressed, particularly to the use of unclean sponges. In this hospital, sponges are hardly used in the wards, and the wounds are cleansed by irrigation. 3. Pyæmia appears to be an occasional complication of grave injuries (especially those in which the interior of bones is extensively exposed) in all situations and in all states of the atmosphere, peculiarly in close and crowded localities; but there seems to us abundant evidence that the predisposition to this affection is very greatly increased by the prevalence of what is called a "traumatic atmosphere" i.e., by the prevalence in the air of the ward of the exhalation of suppurating wounds. The

* This is a recent improvement; formerly the water-closets were in the centre of the building; and the drains ran under the building.

† These death-rates are low, and especially on the surgical side. The surgical wards are, no doubt, very good, and the surgical practice probably successful. But it would not be fair to use the statement of the death-rates in any argument, without noticing that many cases gain admittance here which could not be admitted if the demand for beds were more brisk. Thus, in one surgical ward, out of 7 cases at the time of our visit, there were 3 of enlarged tonsils and 1 of vanula.

ABERDEEN.

absence of crowding in this hospital, and the large space left between the beds in the surgical wards, would account for the lightness of this complication.

At the time of our visit there were in the surgical wards three cases of these secondary complications, only one of which (a case of simple erysipelas of the face) had originated in the hospital. The others, which had been admitted, were a case of diffuse cellular inflammation, and one of phagedæna.

At this time the wards contained 75 surgical patients; viz., eight venereal and five ophthalmic cases, 13 cases of accident (four of which were simple fractures and two burns), 21 cases of acute surgical affection, and 23 of chronic surgical disease. There were six operations of the classes selected for comparison; viz., two primary amputations of the arm, one amputation of the thigh, and one of the leg for disease, one lithotomy, and one operation for strangulated hernia. There were 49 medical cases; viz., 13 fever (four typhoid and nine small-pox) and 26 ordinary medical cases.

As to the number and the results of surgical operations, the report gives us full details, except only in one point; viz., that the result of the operations left incomplete in one year is not distinctly stated in the report for the year following. With this reservation (which, however, happens to apply to very few of the cases in this table), we find the following numbers of operations, of the selected classes, during the years 1861 and 1862; viz.:—

Amputation of the forearm, 5;		4 cured;	1 unaccounted for
"	arm - 1	cured.	
"	thigh - 15	5 primary;	4 died.
		10 for disease;	2 died.
"	leg - 5;	all for disease;	2 died.
Excision of the elbow, 2.			
Lithotomy, 15	13 adults;	4 died.	
	2 children.		
Strangulated hernia, 2;		1 died.	

J. S. B. T. H.

ARBROATH.

ARBROATH.—The infirmary is outside the town, on high ground, overlooking the sea, and evidently in a most salubrious situation. It possesses tolerably extensive grounds, which are used chiefly as a kitchen garden.

The infirmary is a single, long building of two floors, with the kitchen and offices built out behind. It contains six wards; one male ward (holding 14 beds), and two small wards (a private ward, and a small-pox ward with five beds each), on the ground floor; and on the first floor, three large wards, containing 12 beds apiece, one for male fever cases, one for female fever cases, and the third a general ward for females. The larger wards are of tolerable dimensions, and allow to each bed 670 cubic feet, more or less. They have opposite windows. The small private ward has a single window, and the small-pox ward two opposite windows. The cubic space to each bed in these wards is less than that in the others. The height of the rooms on the ground floor is 12 feet 7 inches; the height of those on the first floor 11 feet 2 inches. The small-pox ward has a separate entrance, and no direct communication with the rest of the house.

The ventilation of the hospital is effected by the windows (which open by sashes, and which in the fever wards have a pane of perforated zinc), by ventilators in the ceiling, by open fire-places, and by doors. No artificial system of heating is employed. The wards are lighted by gas. They are cleansed frequently, and have whitewashed walls. The bedsteads are of iron; the beds are filled with chaff, and rest on a kind of straw matting. The beds were rather crowded.

The water-closets for the men's wards do not open into the wards; those for the female wards, however, do. They are said to be well drained, but were somewhat offensive. There is one bath-room. The water is derived from a well, and is said to be abundant and good.

There is a matron, and there are two resident nurses, who have, in addition to attending on the patients, to scrub the wards. Extra nurses are occasionally hired. There are four medical men attached to the institution, who take duty for three months each in rotation; and during this time take charge of all patients admitted, whether medical or surgical. The hospital medical officers are also the parish surgeons. There is no resident medical officer or dispenser. There is a small dispensary in the building for emergencies; but the bulk of the medicines are supplied by a druggist in the town, who contracts to provide them at so much a bottle. Water dressing is used in the treatment of wounds, and sponges for the cleansing of them. Lowering measures and bleeding are rarely, if ever, practised. There is no diet table; patients are not limited as to quantity of food, and the nature of it depends on the matron and the medical attendant.

Fevers and other urgent cases are admitted at any time without letter; other patients are admitted on the order of any general practitioner, countersigned by one of the members of the committee of management. The applicants consist chiefly of fishermen, of sail-cloth makers (who form a large proportion of the population of Arbroath), and of agricultural labourers. Less than half come from the immediate neighbourhood. The only cases excluded are those of male syphilitic patients.

The hospital contains 60 beds, of which 26 are for males, 24 for females, and 10 for males or females, according to circumstances. There is no distinction between medical and surgical beds, beyond the fact that there are two fever wards, containing 24 beds between them, and a small ward for variola, with five beds. The average number of beds occupied has not been calculated; but the highest number in the hospital at one time has been 36,

and at the time of our visit the number was 14 only. Patients are allowed to remain for three months.

At our visit the hospital appeared perfectly clean, but from the windows being kept closed one or two of the wards had a slightly disagreeable odour. There were only 14 patients in the house, of whom six were males, eight females; nine were medical, and six surgical cases. Of the medical cases two were cases of small-pox, two, and possibly a third, were cases of typhoid fever. These were all in the fever wards. The other cases were wholly uninteresting and trivial. Of the surgical cases, one was a case of amputation of the thigh for diseased bone, one was a case of ulcer of the leg, and the rest were cases of scrofulous joints.

During seven years, up to 1851, 848 cases were admitted into the hospital, and 81, or 9·6 per cent., died. 512 were fever cases, among which were 51 deaths, or 10 per cent.; 79 were other medical cases, with 19 deaths, or 26 per cent.; 258 were surgical cases, with 11 deaths, or 4·3 per cent.

In the year ending June 30th, 1862, 177 patients were treated to a termination, and 22, or 12·4 per cent., died. Of these, 112 were medical (including fever), of whom 20 or 17·8 per cent., died; and 65 were surgical, of whom two, or 3 per cent., died. The medical cases comprised 46 of fever, of which seven died, one of small-pox, and one of erysipelas; 25 cases of bronchitis, with four deaths, 11 of rheumatism, with two deaths, seven of pneumonia, with three deaths, and 12 of dropsy, with two deaths. The surgical cases seem to have been much less serious, and comprised only one case of compound fracture, and one of cut-throat, but no cases of hernia or of stone. A fair proportion of accidents was admitted, but the accidents seem to have been mostly trivial, or at least not of a kind very likely to be dangerous to life. The two surgical deaths were due to disease of the bladder and to phlegmasia dolens. In the year immediately preceding, 164 cases were admitted, and 21 died, giving a death-rate of 12·8 per cent. 16 of the deaths occurred in medical cases, and five in surgical; the deaths among the latter being due to disease of spine, disease of bladder, injury to hip, ulcer of leg, and burn.

Operation cases are very few; and now no available records are kept; but in the seven years above referred to there were one amputation at the shoulder joint, four of the thigh, five of the leg, four of the arm, one of the foot, and one of the hand, which were successful, and one of the leg, which was fatal. There were two excisions of the elbow-joint, which were successful, and three operations for hernia, of which one ended fatally.

The Arbroath Hospital must be regarded as essentially a country hospital, and occupies a most salubrious site; but the mortality is extremely heavy, especially among medical cases. The chief reason of this would seem to be, that the medical officers of the institution are also the parochial officers, and naturally send into the institution a selection of (if not always acute) at least serious cases, and such as are likely to prove fatal. Nothing shows this more conclusively than the high mortality among the non-febrile medical cases admitted during the seven years above quoted. The fact also that patients are not admitted on governors' recommendations alone would aid materially in the production of this result. There is no evidence whatever that the large mortality is due to any unhealthiness in the institution, or that fever or other infectious cases spread in it, notwithstanding that the fever wards are not cut off from the rest of the house. The surgical practice is evidently very inconsiderable, and it is not therefore surprising that pyæmia and erysipelas, and the like, are of rare occurrence in the hospital.

J. S.-B.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—This infirmary is placed on the borders of Dumfries to the south of the town, close to the river Nith. It is well situated, and has a good-sized lawn and kitchen garden behind, to which the patients have access.

It is a long and somewhat low building, to which additions have been made at various times. The central part has three floors, including the basement, and the two lateral portions, which resemble one another externally, have been added subsequently, and consist of two floors only. The internal arrangements of the hospital are somewhat irregular. The right wing is cut off from the rest, and has its own staircase; the left wing and the central building are incorporated, and present on the first floor two wards (one at either end), extending from the back to the front of the building, and a central corridor, leading from one to the other, with wards back and front opening out of it. The plan of the second story, which is limited to the central building, is precisely the same.

The hospital contains 17 wards. Two of them, on the ground floor, are for the reception of the Militia, and contain 11 beds. They are sometimes used in the absence of the Militia for other purposes. Eleven wards are on the first floor, seven in the main building and left wing, and four in the right wing. Of the former, two are male medical wards, and contain nine and four beds respectively, two are female medical, and hold four beds apiece; one is a female surgical, and has five beds; and the remaining two are an eye ward and a lock ward, holding four beds each, and both for females. The four in the right wing are all male surgical wards, and contain five, eight, four, and four beds respectively. On the second floor there are four wards, which are devoted to the reception of fever and small-pox cases; three of these are for males, and contain respectively nine, ten, and two beds; and one is for females, and contains seven beds.

The wards are mostly small, and all are low, but those in the wings are more lofty than those in the centre of the building. The beds are close, often touching, and evidently

little cubic space is allowed to each. Ventilation is due to windows alone, which, in the wards occupying the whole depth of the house, are situated on two sides; mostly, however, the windows are placed on one side only. They are sash windows, and small. The wards are heated by open fire-places, but at the time of visit these were all closed by fire boards. The hospital is lighted by gas. The water-closets are well supplied with water, and well drained, and in themselves present no particular objection; but that in the small-pox ward seems to have been made in a cupboard, and has no ventilation whatever, or light, excepting through the ward itself. Again, the closets on the first floor, which are for the use of men and women, are in juxta-position, derive light from the same window, and are only imperfectly separated from one another. The water supply of the hospital is abundant and good. There is a bath-room on each floor, and all patients are, as a rule, bathed on admission. The bedsteads are of iron, without curtains. Both hair and chaff mattresses are in use. The latter, if befouled, are emptied and cleansed. The small wards are generally washed once a week; the larger ones once a fortnight. The hospital is cleansed and whitewashed once a year.

There are three day nurses and one night nurse. The nurse of the fever wards takes charge also of some of the wards on the first floor. The nurses are expected to do the scrubbing. There are two physicians and two surgeons, who attend daily, a resident house surgeon, and a non-resident assistant, who does the dispensing. As regards treatment, stimulants are not largely used, but depletion is still less employed. Water dressings, often medicated with zinc and the like, are the general applications to wounds. A sedan chair is kept in the hospital, which is occasionally used for conveying patients to the hospital.

A few patients (medical and surgical) are admitted as urgent cases, but the great majority get into the hospital by governors' letters. The applicants are chiefly the labouring poor (agricultural and others) and domestic servants. They come from both Dumfries and the neighbouring country; less than half from the town itself. Chronic and incurable diseases are excluded by rule, and, except in special cases, women advanced in pregnancy and children under seven.

The hospital contains 90 beds (including the 11 set apart for the Militia); of the remaining 79, 51 are for males, 28 for females; 21 are for ordinary medical cases, 24 for fever cases, and 34 are surgical. The medical and surgical cases are separated, so also are the female syphilitics, and the eye cases, and cases of infectious disease. The average stay of patients in the hospital is 31 days. The average daily number in the house was in 1862 44, of whom 17 were medical, 27 surgical. It is important to note, that though the medical beds (including fever) are the most numerous, the surgical cases admitted into the hospital are more numerous than the medical by about one-third, and that they remain on the average six days longer in the house. This probably depends in great measure on the circumstance, that the fever wards are only occasionally called into use.

At the time of our visit the wards were "stuffy;" the windows were all, or nearly all shut, and the fire-places were closed by fire boards. The 11 Militia beds were unoccupied, but the remainder of the hospital (containing 79 beds) held 60 patients. Of these 42 were males, 18 females; 12 were cases of infectious disease, 21 cases of ordinary medical complaints, and 27 were surgical. Of the infectious cases, 11 were cases of small-pox (which was prevalent at the time in the town), and one was a case of typhoid fever. Of the ordinary medical cases, two were cases of slight pneumonia, one was a case of pleuritic effusion, one a case of erysipelas of the face, and one a case of chorea; the remainder were mostly chronic or trivial. Of the surgical cases, 11 might be regarded as acute, if not actually serious in their nature, and included a case of crushed finger, an incised wound of the arm, three cases of simple fracture, a case of Syme's amputation of the foot for caries, two cases of acute inflammation of the knee, a case of carbuncle, and two of retention of urine. The remainder were cases of syphilis, of eye disease, and other rather unimportant or chronic cases.

During the year ending November 11th, 1862, 471 cases (exclusive of 47 Militia men) were admitted into the hospital, and 21 (or 4·4 per cent.) died. In the year before, 392 cases were admitted (exclusive of 31 Militia men), and 23 (or 5·8 per cent.) died. And in the year before that, again, the admissions were 370 (exclusive of 33 Militia men), and the deaths were 21 (or 5·6 per cent.)

On taking the year ending November 1862 for analysis, we find that, including ulcers, superficial abscesses, and two cases of erysipelas, 78 cases of skin disease were admitted, 20 cases of affections of the eye, and 30 cases of venereal disease. Of fever cases there were only 11 of continued fever and one of scarlet fever. Two cases of pyæmia are mentioned, and five of scurvy. Among accidents and casualties we find seven burns, 15 cases of simple fracture, one of fracture of the spine, four of compound fracture, with one smash, and one of strangulated hernia.

Of the 21 deaths in 1862, three were due to typhus, one to smash, one to fracture of the spine, one to compound fracture of the tibia, and one to amputation of the thigh for malignant disease of the tibia and fibula. All the rest were caused by medical complaints, which, with one or two exceptions, were chronic.

The capital operations of the class selected for comparison during three years were as follows:—

Amputation of thigh	3	-	1 fatal.
Amputation of leg	5	-	1 fatal.
Amputation of arm	2	-	0 fatal.
Lithotomy	1		0 fatal.

Pyæmia and erysipelas would seem to be rare. A case of the former disease had occurred within the last few months, and proved fatal, in a case of amputation of the thigh

for injury, but gangrene had previously set in; and recently, also, erysipelas attacked a case of excision of the lower jaw; but the case turned out favourably. It is obvious, however, from the figures above quoted, that accidents and severe surgical cases, and cases requiring operation, are extremely rare. During the late epidemic of small-pox, four or five cases have broken out among patients in the general wards; but this circumstance is probably dependent on the fact, that the nurse of the fever wards does duty also in some of the other wards.

The Dumfries Hospital is undoubtedly a country hospital, and its arrangements and construction are such as would doubtless insure unhealthiness in any town or crowded hospital. It is interesting to remark, that although the mortality is considerably lower than that in the Arbroath and that in the Montrose infirmaries, the hospital is neither so well placed, nor so healthily arranged in any respect as they are. The difference is chiefly due, first, to the fact, that a large proportion of cases, such as eye diseases, skin affections, and venereal disorders, which rarely prove fatal, are admitted into the hospital at Dumfries; that the medical cases (and the surgical in great measure) are admitted by governors' letters, and that persons in a dying condition, or considered to be incurable, are excluded. The habitual admission of fever cases, however, necessarily tends to raise the mortality.

J. S. B. T. H.

DUNDEE.

DUNDEE.—The infirmary at Dundee is of modern construction, having been opened for the reception of patients about 10 years. Its situation is beautiful, on a bold hill, overlooking the Frith of Tay, and with a southern aspect on its chief face. The building forms three sides of a rectangle: it is constructed on the corridor principle. The corridor runs round the whole of the inside of the building (the side opposite to the main front), and is pierced by opposite windows, looking into the courtyard and into the wards. The windows of the wards are also directly opposite the latter row, so that a direct thorough ventilation is established from one side of the house to the other, across the corridor. The windows between the wards and corridors are always open, and in the daytime the windows into the open air are kept open as much as the weather will permit. A large central hall and staircase divides the main body of the building into halves, and there are separate staircases for communication with the wings. The projections at the corners of the buildings, which appear at first sight designed for architectural effect, are made into small wards, and bays at the end of the corridors, which are shut off when necessary by curtains, in order to serve as operation rooms. The main wards are of considerable size, and hold from 24 to 26 beds. The beds have a cubic space of 1,400 feet each in the general wards, and rather less in the fever wards (1,364 feet). The beds are placed singly between each pair of windows, at a distance from each other of about 5 feet 2 inches, and 8 feet 10 inches from the opposite row. The arrangements for water-closets and baths are excellent, these conveniences being all placed quite away from the wards, on the other side of the corridor, and being well constructed in themselves. The corridors and wards are heated by numerous fire-places. No other means of ventilation* or of warming exist. There are three floors of wards, but only two (the first and second) are in use, as there are not funds at present to keep the ground floor wards open. From the same cause there are not always patients to occupy the whole of some of the large wards which are open, so that it has been found expedient to divide one into two parts by a party wall, since it was found cold and cheerless, from being only half full in winter time. The whole number of beds is 170, of which about 140 are usually full.

So much for the construction of the hospital. As to its regulations, like those of most Scotch hospitals, they are more liberal and more comprehensive than those of English provincial hospitals. No disease is excluded; and although letters are required for ordinary cases, they are received daily. Cases of fever and urgent cases of all kinds require merely a medical certificate of the nature of the case, and a van is sent from the hospital for the former class of patients. There are separate wards for fever and for small-pox, as well as small Lock wards.

With respect to the success of the practice at this institution, it certainly appears considerable. It must be remembered that a very large proportion of acute cases come into the house, consequently the death-rate is equal to that which prevails at a metropolitan hospital. On this subject we cannot do better than quote from the very useful and well-drawn reports which this hospital furnishes. In the one last published (June 1862 to June 1863) the cases are thus summarised;

"I. Of medical cases.—" Of the total 961 cases treated, 583 recovered, 183 were relieved, " 95 died, and 95 still remain under treatment. Chest affections, as usual, form about " one third of the whole medical cases; this year being 321. Fevers, numerically, are " next in rank, and claim fully one fifth, having been 202 in all. Of these, there have " been 156 cases of typhus and typhoid. Small-pox has again appeared among us. I have " to record 23 cases in all. Of these, six died, all I believe, unvaccinated.†

II. Of surgical cases.—" The number of patients admitted and treated in the surgical " wards has been 638. Of these, 493 have been dismissed cured, 70 relieved, 18 died, and " 57 remain in the house. The two principal classes which I shall notice are,—first, diseases

* But the deaths from typhus of two resident medical officers in succession, and the communication of fever in the house (*v. supra*), have led to the appointment of a committee to consider whether the ventilation is sufficient.

† This part of the Report is by Dr. Pirie, Attending Physician.

"of the skin, and, second, injuries and accidents. Of the first of these, it will be observed "that 231 have been treated, including 82 cases of ulcer, which always furnish a large item "to this class. As the principal causes are poor feeding and want of rest, in worn-out "or delicate constitutions, it is within the walls of an hospital that the principal means "for curing them are to be found. The other chief diseases in this group are scabies "and eczema, of which 32 have been under treatment. The next class is that of "injuries and accidents, a class for the most part always of a serious nature. The "number during the past year amounts to 63. I am sure it will be very gratifying "to the governors of this hospital to learn that the hospital still sustains its high sani- "tary condition, and I have little doubt it will continue to do so. No such formidable "maladies as erysipelas or hospital gangrene have ever occurred, so as to cause the least "alarm. This circumstance is owing in a great measure to the elevated site upon "which the house is built, the excellent management for the free ventilation of pure "air, and the maintaining of scrupulous cleanliness throughout the wards."* It will be seen from the above that the death-rate of the whole hospital during the year was 7·06 per cent., of the medical cases 9·9, and of the surgical 2·8 per cent.

We have quoted the above passages to show how perfectly feasible it is to maintain in a high state of efficiency an establishment which shall really fulfil all the purposes of a hospital,—an institution, that is, from which no poor man labouring under serious disease shall be turned away,—which shall not present the monstrous anomaly, that the more violent and dangerous the disease, the less chance is there of the patient's reception; and which shall not be so surrounded with formalities and privileges as to be regarded, and in fact to become, not the public refuge for the sick poor, but a private institution for the relief of the subscribers' nominees. It must be surely far more easy to make provision for the relief of all cases of sufficient urgency in a small country place than in a large manufacturing town like Dundee; nor is the accommodation that would be required for such a purpose wanting at most of our country towns; only the habit of making the hospital a place for the treatment of chronic cases,—by the *letter system*, by the exclusion of fevers, and by giving up such a disproportionate number of beds to surgical cases,—has become almost inveterate,—and it appears to be the most natural thing in the world that a number of cases of chronic rheumatism, hysteria, bad legs, scrofula, &c. should occupy the hospital beds, and receive the care of the practitioners of best repute in the neighbourhood, while patients labouring under those acute diseases in which the absence or presence of quiet, fresh air, careful nursing, proper diet, skilful and deliberate medical treatment, and careful diagnosis, involves death or life, should be left in their squalid crowded cottages, fed probably by casual charity, and attended, as best they may, by the overworked parish doctor or his apprentice.

The experience of this hospital bears strongly also on the question of separating fever patients into distinct wards, or scattering them about the general wards of the hospital. We have treated this subject in the body of the Report; but we must not omit to remark, that at the time of our visit the authorities had to deplore the loss of a very distinguished young physician, Dr. Glen, the resident medical officer, who was then lying dead of typhoid fever, and who had suffered severely the previous year from typhus; and that since our visit Dr. Glen's successor has also died of typhus fever, and several patients admitted with other maladies have been attacked with typhus. This has occurred chiefly of course in the fever wards, but a few cases of typhus have originated also in the general wards.

With regard to the out-patient department, it is differently managed here from the system that prevails in London. The out-patients are seen at their own houses by officers appointed for that purpose by the hospital, and only attend at the infirmary in order to procure medicine. This plan has, at any rate, the merit of bringing cases of serious disease under the notice of the hospital authorities.

The operations of the selected classes performed during the three years 1861-63 inclusive are thus given:—

	No.	Died.
Amputation of the thigh	4	2
" " leg	16	4
" " arm	7	2
" " forearm	5	0
Excision of the elbow	3	1
Herniotomy	2	1
Lithotomy	1	0

As to the cases in hospital at the time of visit, there were 118 patients in the house, 55 of whom were medical and 63 surgical. The former included in the fever wards one case of small-pox, four of typhoid, and 15 of typhus fever; there were 11 other acute cases; the remaining 24 cases were chronic or trivial. Out of the 63 surgical cases, 16 were accidents, including two simple fractures, one compound fracture, and one burn; 10 were acute cases, including one primary amputation of the leg, and one amputation at the ankle joint; 37 were chronic or trivial. The number of open wounds or sores was 37.

T. H.

EDINBURGH.

EDINBURGH ROYAL INFIRMARY.—The Royal Infirmary at Edinburgh is an institution on as liberal a foundation and on as grand a scale as any of our metropolitan hospitals. It receives every kind of disease, not even small-pox being excluded; nor does it appear that cases are excluded, as is the case in our subscription hospitals, for want of

* This part of the Report is by Dr. Crockatt, Attending Surgeon.

acquaintance with some governor of the infirmary; but the managers of the institution have wisely directed that "the selection of the patients who are to be admitted shall be "regulated solely by a regard to the relative urgency and severity of their ailments." The only check upon the perfectly free admission of patients is, that the managers require a written guarantee for the removal of the patient when it becomes requisite; and even this is dispensed with in cases where delay would be prejudicial to the patient; consequently every kind of disease is represented here, according to its severity; and the old established reputation of the place brings patients to it from all parts of Scotland, and even from the north of England. Another feature which must attract the favourable attention of an English observer is, that the due proportion is kept here between medicine and surgery; so that, instead of the greater number of beds being allotted to the lighter and less common cases, those of surgery, there are here three medical beds to two surgical. The precise number at the date of our visit was 318 medical and 201 surgical; total 519; 292 male and 227 female. A new Lock hospital for females was in the course of construction, which would add a few to the surgical beds.

The hospital is situated in the most crowded part of the town, close to the quarter inhabited by the poor Irish population; on one side, the east, it is quite open down to the sea, but is shut in by buildings on all other sides. It stands on about four acres of ground. There is an airing ground behind it for the patients.

The hospital consists of five perfectly distinct buildings, of different dates; 1. the original building or the old infirmary; 2. The old surgical hospital, which was originally the High School; 3. The new surgical hospital, built on ground recently acquired; 4. The fever house, formerly the College of Surgeons; 5. The Lock hospital, not completed at the time of our visit. Besides these there is a separate house for the resident officers and their servants, and another for the night nurses of the hospital.

The hospital is so irregularly built that it would be tedious, and would serve little purpose, to endeavour to describe its entire interior arrangements, nor have we the means of producing plans of it. It will suffice to say that the old building is arranged on the "block" plan, the wards being the whole thickness of the block, and ventilated by opposite windows; but in the greater part of the hospital the arrangement is on the corridor plan; the wards, especially in the new surgical hospital, are smaller, and are certainly imperfect in the matter of ventilation. This has been to a great extent remedied in some of the wards by cutting off, as it were, the top of the corridor, and throwing it into the ward, so as to give the wards ventilation by opposite windows, though the windows on the side of the corridor are but small; and in the old surgical hospital, where this plan has been adopted, as the wards are more spacious and airy, there is no complaint. In the new hospital the wards were originally ventilated upon a system somewhat resembling the "aspiration" system in use at the Hôpital Lariboisière at Paris. The consequences were disastrous. After the wards had been in use for a year or two a tendency to ordinary erysipelas became marked, and in about six years, October 1850—April 1857, there ensued a decided outbreak of phagedæna, at a time when phagedæna did not prevail elsewhere in the town. The artificial system of ventilation was then abandoned; openings were made between the wards and corridors, and the ventilation by means of the windows was made more complete; since which time the wards have been moderately healthy. There are wards on four stories, those on the upper floor being appropriated to cases of fever and to convalescents. As to the average cubic space, it is difficult to give any useful data, since it varies in almost every ward. The extremes appear to be 800 and 1,700 cubic feet per bed. The average number of patients in the house during the year 1862 was 380; but it does not follow from this large difference between the number of beds and the number of patients that there was an unusual proportion of beds vacant in the ordinary medical or in the surgical wards, the difference having arisen from various causes. The death-rate in 1862 was 10·5 per cent.

1. Some years since, the revenue of the infirmary proving inadequate to meet the expenditure, several of the wards in the surgical department had to be closed; and although the revenue of the infirmary has since, upon the whole, increased, the increase which has taken place has been more than counterbalanced by the rise in the price of provisions, and the more liberal system of dieting adopted by the medical officers. These wards consequently still remain shut.

2. For some years past fever has not prevailed here in an epidemic form; consequently, the fever house and several of the fever wards in the medical house have been shut, and the fever wards actually open only partially filled,

3. The shutting of the clinical wards in the medical department in autumn, when the house is being cleaned and painted, has contributed to the same result.

The fever wards are kept separate from the rest of the house, the door of communication between them and the general hospital being locked. The house surgeon has orders not to visit the general hospital for half-an-hour after he has been to the fever wards. A "quarantine" ward is used, in which to place suspected cases, till they have to be transferred to the fever wards. There are also separate wards for erysipelas and the allied diseases. Sedan chairs are kept for the use of fever patients, and a sort of ambulance is let out for hire.

The drainage of the hospital is very good, and the water supply is abundant and gratuitous. The water-closets in the new surgical hospital, are placed in the wards, which renders the latter somewhat offensive at times. In the old building they are separated from the wards by a passage.

The medical staff consists of three physicians and one assistant physician, two professors of clinical medicine, one professor of clinical surgery, two ordinary surgeons,

one extra acting surgeon, two assistant surgeons, one ophthalmic surgeon, and one apothecary. There are also four house physicians and three house surgeons. The wards of the professor of clinical surgery appear to to be in constant use; but those of the professor of clinical medicine are shut up during the vacations of the university, which will account for part of the large difference between the average of patients and the number of beds.

The number of nurses is large, and this is accounted for by the great number of small wards. At the time of our visit, when both the medical clinical professors' wards and those of the extra acting surgeons were closed, the numbers of nurses was 63; when these are open it is considerably larger.

The treatment is, like that in London, chiefly stimulating and tonic. A good proof of the change in this respect which has taken place in late years is furnished by the bill for leeches, which has dropped in 20 years from nearly 300*l.* to 7*l.* 8*s.* in the past year. Wounds are lightly dressed, and usually cleansed with tow. The wards are scrubbed weekly. The mattresses are of hair or of straw. After any offensive case, the hair is taken out and cleaned, or the straw burned.

It will thus be seen that the regulations of this hospital are in many respects identical with those of the chief metropolitan hospitals, the principal exceptions being the admission of small-pox, the institution of separate fever wards, and the peculiarity of keeping separate wards for professors, who only use them periodically.

The nature of the cases being about the same as in metropolitan hospitals, it appears as if at present the success of the practice was also about the same. We have pointed out some faults of construction which we believe to be real, and which, if so, must have their effect on the success of practice; but this effect is after all trifling, if we may judge by the published reports, and by what we saw and heard at the hospital. The new wards used to be unhealthy, as we have above noticed, while the artificial system of ventilation was in use, but at present, as we are informed by one of the officers of the institution, "considering the faulty construction of the wards of the new surgical house, they have been "wonderfully healthy since the natural system of ventilation was resorted to." This gentleman very wisely adds, "that any hospital, receiving the class of cases that the "Royal Infirmary does, should be altogether free from erysipelas or occasional unhealthy "sores, is what we can hardly expect."

The success of operations is said to be good, and the activity of surgical practice here appears to prove that it is so. We append a table of the number and results of operations of the selected classes during the years 1860, 1861, 1862.

Years.	Hip Joint.						Thigh.						Leg.						Ankle.						Shoulder Joint.					
	Injury.				Disease.		Injury.				Disease.		Injury.				Disease.		Injury.				Disease.		Injury.				Disease.		
	Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.
1860	1	.	1		.	.	.		3	.	3		13	12	1		7	6	1		.	.	.		1	1	.		12	11	1
1861	.	.	.		.	.	.		4	1	3		9	8	1		5	4	1		3	3	.		.	.	.		8	7	1
1862	1	.	1		1	1	.		10	3	7		19	16	3		7	2	5		2	2	.		6	5	1		12	12	.
	2	.	2		1	1	.		17	4	13		41	36	5		19	12	7		5	5	.		7	6	1		32	30	2

Years.	Arm.						Fore Arm.						Excision of Joints.									Lithotomy.						Hernia.			
	Injury.				Disease.		Injury.				Disease.		Shoulder.			Elbow.			Knee.			Under 15 Years.			Over 15 Years.			Strangulated.		
	Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.		Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.
1860	.	.	.		.	.	.		.	.	.		1	1	.	3	3	.	10	9	1	1	.	.	1	1	.	2	2	.
1861	3	2	1		1	1	.		4	4	.		.	.	.	1	1	.	14	13	1	1	.	.	1	1	.	5	5	.
1862	2	2	.		1	1	.		3	3	.		2	2	.	.	.	.	14	14	.	1	.	1	2	2	.	7	4	3
	5	4	1		2	2	.		7	7	.		3	3	.	4	4	.	38	36	2	3	.	3	5	4	1	14	11	3

Years.	Strangulated.		
	Total.	Recovered.	Died.
1860	5	3	2
1861	9	7	2
1862	7	5	2
	21	15	6

It seems hardly worth while to go minutely into the nature of the cases admitted, or into the causes of death, since those are just the same as at a large London hospital,

except that there are a number of cases of small-pox, varying with the prevalence of that disease. We add some information with which we have been favoured as to the occurrence of fever and small-pox amongst the other patients and the attendants.

"1. Suspicious cases of fever and small-pox have occasionally but very rarely occurred among the patients of the ordinary medical and surgical wards, but it was not established to the satisfaction of the medical officers that the disease had been contracted in the house in any instance.

"2. Unless when fever prevails extensively in an epidemic form the nurses and medical attendants rarely suffer. During the year ending 30th September 1863, however, one of the resident officers in attendance on the fever wards caught fever and died; one of the nurses also had fever, but recovered. Of the nurses and medical officers engaged in the small-pox wards, none suffered in the epidemic which prevailed from October 1862 to April 1863.

"3. Until August 1862 the provision for small-pox cases consisted of two wards in the centre of the building, with separate scullories, closets, and other conveniences. At that time it was thought desirable to keep these patients separate from all the others, and they were accordingly removed to the fever house, which was then vacant, and where the few cases that still occur from time to time are placed. In future, every effort will be made to treat small-pox patients in a building apart from the other patients.

"4. As regards the admission of visitors to these wards, the rule is, that the nearest relatives shall be admitted, and these only on producing an order from the medical attendants; that they shall not on leaving the small-pox wards be permitted to visit any other part of the house, and shall be accompanied to the gate by one of the nurses or other of the servants of the establishment."

We have noticed, in the body of this report, that an attempt which was made at this hospital some years since to treat fevers in the general wards, with the precaution of withdrawing contiguous beds, was abandoned in consequence of fever spreading in the wards.

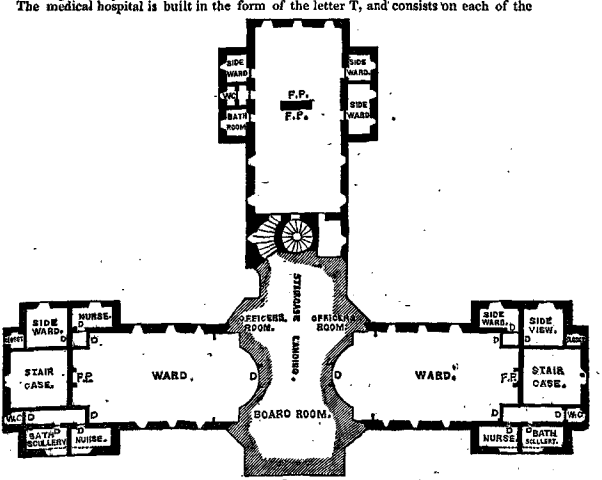
J. S. B. T. H.

GLASGOW.

THE GLASGOW ROYAL INFIRMARY, the largest hospital in Scotland, is situated within the city, surrounded by a poor neighbourhood. There are gasworks close by, the cathedral grave yard and the Necropolis almost adjoin it, and are in use, and, further, there is a brook in the neighbourhood, which receives part of the drainage of the infirmary, and in hot weather is sometimes offensive. The hospital, however, stands on one of the highest sites in Glasgow, 130 feet above the Clyde, and occupies about five acres of ground. A green about half an acre in extent is used as an airing-ground for patients.

The infirmary itself comprises three distinct five-floored buildings, one of which is appropriated to ordinary medical cases, one is the fever house, and the third (the newest) is the surgical hospital.

The medical hospital is built in the form of the letter T, and consists on each of the

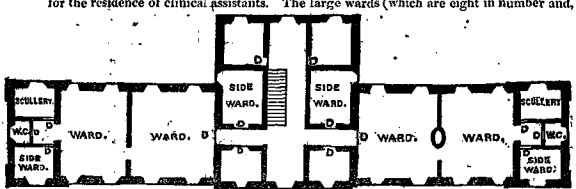


Front.

GLASGOW INFIRMARY.—Old Building.

upper four floors of three long wards radiating from a centre, which is occupied by the central staircases and by officers' and other rooms; of three back staircases, of which those in connection with the two front wards lie at their distal extremity, and of which that in connection with the posterior ward is placed at the proximal extremity; and of side wards, bath-rooms, water-closets, and nurses-rooms conveniently grouped along the sides or at the extremities of the large wards. The wards are long, broad, and vary on the different floors from 11 to 12 feet in height; they have opposite sash windows (not very numerous), and in the case of the back wards windows at one extremity as well. The comparative deficiency of windows depends on the manner in which the side wards and other offices are arranged. Ventilation, however, is aided to some extent by the presence of ventilators in the ceilings or walls. The wards are heated by open fire-places, which in the front wards are against the wall, and in the back wards in the centre of the floor. The large wards are 12 in number, contain from 14 to 18 beds a piece, and have grouped about them two or three side wards, holding one or two beds each; they are somewhat overcrowded, and allow only of a cubic space to each bed varying between about 800 and 1,000 feet.

The fever house is an oblong block, divided into two wings by the intervention of the staircase, and certain small rooms, some of which are side wards, and the others rooms for the residence of clinical assistants. The large wards (which are eight in number and,



FRONT.

GLASGOW INFIRMARY.—Fever House.

of which two lie on each floor), are long broad chambers 12 feet high, partially divided into two by a partition, which contains the warming apparatus. Each is approached from the central staircase, by a passage with a room on either side, of which one is a side ward; and at the opposite extremity of the ward in the centre, is a water-closet, approached by a lobby, flanked on one side by a scullery, and on the other by a second side ward. The wards are well lighted with opposite sash windows, but are warmed by hot air admitted from the basement through a special apparatus situated in the partition above referred to. They have no fire-places. The wards contain (including cribs) from 16 to 22 beds apiece, and allow of a cubic space to each bed of between 620 and 860 cubic feet. The two side wards to each large ward contain four beds between them. One of the wards on the ground floor appears to be disused, and one is appropriated to the reception of surgical cases. On the top floor two small rooms, with two beds each, are used for small-pox patients. There is only one bath-room, and this is situated on the ground floor.

The surgical hospital was opened in May 1861. The general plan is not very dissimilar to that which obtains in the fever-house; that is to say, it consists of a central staircase, to the back of which are the clerks' rooms, and from either side of which a long large oblong ward opens. These wards are all 60 feet long by 28 wide and 14 high, and have therefore a cubic capacity of 23,520 feet. They hold, generally, from 20 to 22 beds (including cribs), and hence allow to each bed a cubic space of over 1,000 feet. They have numerous opposite windows, and ventilators for the admission of air and for the carrying off of foul air. The fire-places are two in each ward, placed back to back, in the centre of the floor. The beds are generally so placed as that each one has a space between two windows to itself. At the further end of each ward occupying the right wing there is a scullery and water-closet; and from the further end of each ward in the left wing a passage projects having a series of rooms opening out of it on either side. Two of these are side wards; one is a patients' day and reading room, and the others consist of scullery, nurse's room, bath-room, water-closet, and a lift for patients' food, &c. Altogether, there are eight large wards, besides side wards.

The drainage throughout the house is supposed to be good; but a year or two ago it seems there were some defects, and an outbreak of hospital disease in the surgical hospital was attributed to this cause. The water-closets throughout the house are well placed and arranged; those in the new hospital are Jennings's patent. Bath-rooms are abundant; and all patients, by rule, are bathed on admission. The water supply is abundant, and derived from Loch Katrine. The walls are coloured, the ceilings whitewashed, and the floors of ordinary unpolished wood. They are washed regularly twice a week, and the hospital itself is cleared out and thoroughly cleansed once a year. The beds are generally spring-beds, with hair mattresses; for fracture cases, however, the beds have a firm basis.

There is one day nurse and one night nurse to each large ward, and occasional assistant nurses when required. The house work is done by lobby women and laundry maids. The total (all included) amounts to 90 or 100 persons.

In addition to the visiting surgeons and physicians, there is attached to each medical officer a resident assistant. Of these, some take charge of the fever house and live apart from the rest. It seems that there is little or no general bleeding; and as regards leeches it is sufficient to say that during the year 1862, 11*l.* 17*s.* only were spent upon them. The principal treatment is undoubtedly stimulant and tonic. Water dressing, simple dressing, and poultices are used in the wards. Wounds are cleansed with tepid water and sponge cloths, which are washed before they are used a second time. Sponges are used at operations only. Patients are admitted by letter at any time; accidents and urgent cases without. Fever and small-pox cases, on the certificate of any medical man, are brought to the hospital in conveyances belonging to the institution.

In 1862, out of a total of 3,709 admissions, 627 were cases of accident; the number of other urgent cases, however, admitted without letter, is not stated. No classes of disease are excluded, but incurable cases are restricted, and cases of delirium tremens are admitted only provided friends take charge of the case. Those who gain admission are chiefly mechanics, sailors, and factory girls.

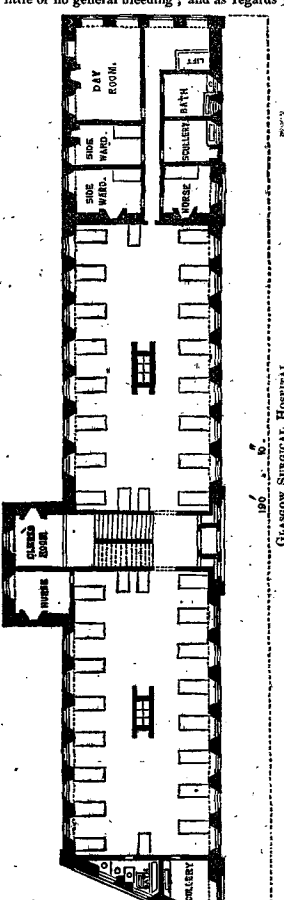
The hospital contains 28 large wards, besides the two small small-pox wards, two or three private wards for the reception of pupils and others, and a large number of side wards. Of these large wards, 12 are in the medical hospital (with 236 beds*); eight are in the fever house (with also the small-pox wards, and at the time of visit 175 beds); and eight in the surgical hospital (with 198 beds). So that at the time of visit there were (including cribs) 612 beds. Of these, 392 were for males, 220 for females. Devoted to ordinary medical practice there were 213, to fever cases 156, and to surgical cases 243.

At the time of visit there were in the hospital 257 male and 157 female patients; in all 414. Of these, 140 were in the ordinary medical wards, 93 were in the fever house, and 181 were in the surgical wards. Of the 140 medical cases, 20 were regarded by us as acute, and 120 chronic. Of the acute cases, two were cases of typhoid fever, three cases of scurvy, two of acute rheumatism, and five of pneumonia; some of the others were trivial. Of the chronic cases, we regarded 54 as being trivial (as regards danger to life); the remaining 66 as serious. The latter number included nine cases of Bright's disease and 25 of phthisis.

Of the cases in the fever wards, two were cases of typhoid, seven were small-pox cases, one was a case of pneumonia, one was a head case, and the remainder (82) were cases of typhus.

Of the 181 cases under the care of the surgeons, 77 were cases of accident, 43 acute cases, and 61 chronic. There were 87 cases with open wounds.

Among the above were included 36 simple fractures, nine compound fractures, five burns, and three cases of erysipelas. The operation cases were as follows:—two amputations of thigh for disease and one of primary amputation, one of ampu-



* The number of beds here given includes those in the side wards connected with each of the large wards.

tation of the leg and four of Syme's amputation, all for disease; and five primary amputations of the fore-arm. Further, there were three excisions of the elbow (one primary), four excisions of the wrist, and a case of lithotomy in a child.

In looking to the records of the hospital we find that the number of medical, fever, and surgical cases admitted respectively, with the deaths and death-rates, for three years are as follows:

Year.	Medical cases.	Deaths.	Mortality.	Fever.	Deaths.	Mortality.	Surgical.	Deaths.	Mortality.	Total.	Deaths.	Mortality.
1862 - -	2,150	198	9·2	985	161	16·3	1,507	127	8·4	4,642	486	10·4
1861 - -	1,863	181	9·7	709	117	16·5	1,531	116	7·5	4,103	414	10·0
1860 - -	1,527	149	9·7	603	87	14·4	1,612	106	6·5	3,742	342	9·1

It will be observed that the mortality is high, especially among the fever cases. It will be observed too that the number of medical cases (exclusive of fever cases) generally exceeds the number of surgical cases. The high general rate of mortality is therefore partly explained.

On taking the year 1862, for more particular examination, we find that the average daily number of patients in the whole institutions was 887, and the mean residence of patients was in the medical wards 29, in the fever wards 27, and in the surgical wards 37 days.

Of the cases admitted into the general wards during this year, we observe 289 cases of bronchitis, with 22 deaths; 399 cases of phthisis, with 76 deaths; 102 cases of pleurisy and pneumonia, with 14 deaths; 77 cases of heart disease, with 14 deaths; and 110 cases of general and hepatic dropsy, with 41 deaths.

Of the cases in the fever wards, 780 were cases of typhus, of which 132 died; 79 were cases of typhoid, of which 17 died; 43 were cases of variola, of which three died; and 10 were cases of scarlet fever. 18 cases of pneumonia, with 4 deaths, were admitted into these wards, with several other acute non-contagious cases. Of cases received into the surgical wards 605 were cases of accident, including 82 cases of burns and scalds, of which 12 died; 223 were simple fractures and 52 compound fractures, among all of which there were 15 deaths.

The list of operations for the three years ending December 31st, 1862, is appended.

LIST OF OPERATIONS.

	1862.		1861.		1860.		Total.	
	No.	Died.	No.	Died.	No.	Died.	No.	Died.
Amputation at hip and of thigh, for accident	14	6	7	4	3	0	24	10
Amputation at hip and of thigh, for disease	7	0	14	7	8	2	29	9
Amputation of leg and foot, for accident	21	2	12	7	5	3	38	12
Amputation of leg and foot, for disease	10	0	10	3	7	2	27	5
Amputation of arm and at shoulder, for accident	6	2	6	3	11	2	23	7
Amputation of arm and at shoulder, for disease	3	0	2	1	3	0	8	1
Amputation of fore-arm and hand, for accident	9	1	8	3	7	1	24	5
Amputation of fore-arm and hand, for disease	1	0	2	0	3	0	6	0
Excision of hip	0	0	0	0	2	0	2	0
Excision of knee	1	1	2	0	0	0	3	1
Excision of ankle	0	0	0	0	2	0	2	0
Excision of elbow	11	1	8	0	3	0	22	1
Lithotomy	10	1	6	0	6	1	22	2
Herniotomy	7	2	6	5	4	3	17	10

Many of the operations performed in 1862 (at least 9) died of pyæmia; and of those in 1861 at least 11 died of pyæmia, and two of erysipelas. In 1860 no deaths from pyæmia are recorded.

The Glasgow Infirmary is certainly a very fine institution, and fulfils very thoroughly all the duties which a hospital is intended to fulfil. It receives a large number of serious cases, both medical and surgical, and the mortality is such as under the circumstances we should have naturally expected it to be. The surgical wards are particularly good and well ventilated, the medical wards also are very fairly arranged, but both in these

and in the fever wards the beds are evidently too numerous in proportion to the size of the wards. In the fever wards the heating is artificial, and renders the wards close; it is generally disapproved of.

The health of the infirmary is considered to be generally good; but we were told that not long ago, when small-pox cases were kept on the lower floor of the fever house, the disease spread (conveyed it is supposed by nurses) to other wards, both in the fever house and elsewhere.

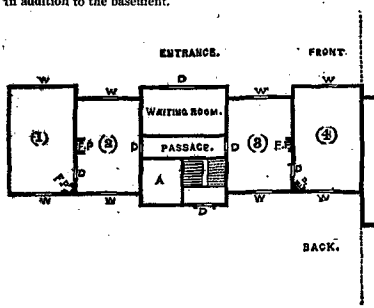
Typhus fever would seem to spread rarely to other patients in the same ward; but during the last two years one physician's assistant contracted the disease and died, and three of the night nurses have been attacked. It is supposed, however, that some of the convalescent patients, notwithstanding precautions, carry the disease home with them.

Erysipelas is said rarely to be seen; phagedæna occurred once two years ago, shortly after the opening of the new surgical hospital, and was supposed to be due to some defect of drainage. Pyæmia is said to be not common; but the results of operations for 1861 and 1862 would seem to shew that pyæmia is a not infrequent cause of death in operation cases. We should add, that no difference has been observed in the healthiness of the wards on different floors. J. S. B. T. H.

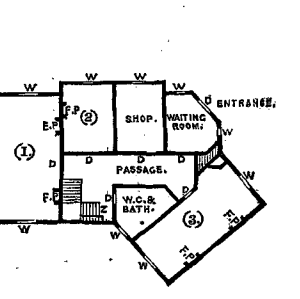
GREENOCK.

GREENOCK HOSPITAL.—The hospital is situated towards one side of the town, on rising ground, and about 35 feet above the level of the Clyde. It occupies three or four acres; and two acres, at least, of lawn and garden, are accessible to patients.

It forms a long, somewhat irregular block, of which one half is a fever hospital, the other half a general hospital for medical and surgical cases, the two, although adjoining, being perfectly divided the one from the other. The building has two stories in addition to the basement.



FEVER HOSPITAL, GREENOCK.



GENERAL HOSPITAL, GREENOCK.

The fever house is symmetrical in form. In the centre in front is the entrance hall, or waiting-room, behind which is a transverse passage, and behind this, again, on the one side a staircase, on the other a small room. On either side of the portion of building just spoken of are two wards, each extending from back to front, and having a window in each of these situations. The door of the inner ward is at the end of the passage, and the outer ward can be entered only through its neighbour. The wards contain eight or nine beds each. On the first floor there are five wards, the difference resulting from the fact that a space on the upper floor corresponding to one of the wards on the lower floor is divided by a continuation of the central passage into two smaller wards. They contain eleven, nine, eight, four, and four beds respectively. The wards in the fever house are 12 ft. 4 in. high, and the cubic space allowed to each bed is between 750 and 820 feet. There is one bath-room and water-closet (both in one) on the first floor, adjoining the staircase, for the use of all the patients.

The arrangement of the general hospital resembles in some particulars that of the fever house, but exigencies of space have compelled an odd obliquity in one half of it. It presents, like the other on the ground floor, a central portion in front, with a transverse passage behind, and behind this again the staircase, and a room which contains the bath and water-closet for the floor. At each end of this passage there is a ward, extending from back to front, with a window at each extremity. In the central part are comprised the waiting room, the apothecary's shop, and a small ward, with a window only one side. The wards contain twelve, five, and eleven beds each. The arrangements on the first floor are nearly the same, and there are three wards, but one only is large, containing 12 beds; the others are over the small ward and over the shop, and contain five and four beds respectively. The height of the wards on the ground floor is 14 feet; the wards on the first floor are of the same height as those of the fever house. The cubic space allowed per bed is from 760 to 820 feet.

The windows in both hospitals are ordinary sash windows; and the general hospital has, in addition, to promote ventilation, ventilators either in the ceilings or in the walls; open fireplaces and gas are in use. The floors are scrubbed; the hospital whitewashed once or twice a year. The bedsteads generally are not more than two feet apart. They are without curtains, and of iron. The mattrasses are of straw. The beds and bed furniture of patients who die are effectually purified.

The hospital is well drained, but was not so a few years ago. The water-closets and bath-rooms are in one. They communicate only with the corridors, and are unobjectionable. The water supply is good and unlimited.

There is a nurse and an assistant nurse for the general hospital; and two nurses (a night and a day nurse) for each floor of the fever house.

Four medical officers are attached to the institution, who take duty in rotation for three months each, in such a manner that while one has charge of the general hospital, one has the fever wards, and a third the out-patient department.

Stimulants are largely used, but no venesection, and very little local bleeding. Water dressing is used in the treatment of wounds. They are generally cleansed by irrigation; but sponges are also employed.

Fever cases are admitted on the certificate of a medical man; accidents are received on application; but other medical and surgical cases require a governor's letter. A sedan chair is kept for the conveyance of fever cases, and a stretcher for others. Those who are excluded by rule are mad people, persons in a dying condition, or suffering from incurable diseases, women big with child, and children under seven. Itch cases are generally not admitted. The applicants for admission are for the most part labourers, sailors, mill-workers, domestic servants, and prostitutes. About half of the whole number of patients come from Greenock itself; the remainder from the surrounding country districts. The only rule with regard to the separation of cases is, that infectious cases are placed in the fever house, and female syphilitics in a special ward.

The hospital contains 119 beds, of which 70 belong to the fever house, and 49 to the general hospital. Of the former, 49 are for males and 21 for females; and of the latter, 28 are for males and 21 for females.

At the time of our visit the hospital contained 66 patients, of whom 45 were males, 21 females; and of whom 36 were fever cases, 12 ordinary medical cases, and 18 surgical. The fever cases comprised eight cases of typhus, 23 of small-pox, and five of measles, all placed in distinct wards. The ordinary medical cases comprised three of pneumonia of various degrees of severity, and two of rheumatic fever, the remainder being chronic or trivial. Of the 18 surgical cases, four were acute, eight were cases of accident, and six were chronic. There were 12 cases with open sores. The more serious cases included three of compound fracture, a burn, and a case of hospital gangrene after removal of a toe.

The following is a list of patients admitted into the hospital during three successive years, with the per-centage mortality in fever cases, in surgical cases, and for the total number of admissions.

	No.	Died.	Per Cent.	
1862.				
Admitted into general hospital -	439*	56	11·4	* Of these 253 with 24 deaths were surgical. Mortality, 9·4 per cent.
„ fever „ -	254	31	12·2	
„ total „ -	743	87	11·7	
1861.				
Admitted into general hospital -	366†	41	12·0	† Of these 171 with 12 deaths were surgical. Mortality, 7·0 per cent.
„ fever „ -	133	10	7·5	
„ total „ -	479	51	10·6	
1860.				
Admitted into general hospital -	368	51	13·9	‡ Of these 188 with 12 deaths were surgical. Mortality, 6·5 per cent.
„ fever „ -	152	25	16·4	
„ total „ -	520	76	14·6	

On taking the year 1862 for analysis, we find that 196 of the cases admitted into the fever house were cases of typhus, and that of these 20 died; that three deaths were due to pneumonia, and the rest to various acute affections. Of the 236 general medical cases admitted, we found that 26 were cases of rheumatism, with one death; 21 cases of phthisis, with seven deaths; 45 cases of bronchitis, with five deaths; 13 cases of heart disease, with six deaths; and four of delirium tremens, with two deaths. Of the 253 surgical cases admitted, there were eight cases of burns and scalds, of which three died; 40 fractures, seven of the skull of which six were fatal, one of the spine which was fatal, and four fractures of other kinds which were also fatal (three being compound). There were 41 cases of venereal affections, all of which recovered. To this it may be added, that out of the 253 surgical cases admitted, 109 were accidents, and that 17 out of the 24 deaths occurred

among these latter, so that very nearly all the deaths among surgical cases were evidently the direct or indirect results of accidental injuries.

A considerable number of minor operations are performed, but capital operations do not seem very numerous; thus the only capital operations in the year were an amputation of the hand, and another of the arm for injury, of which both were successful; and a case of amputation of the leg for ulcers and phagedæna, which resulted in fatal pyæmia. Two other cases in which operations were performed proved fatal; one the removal of nævus in a child by ligature, and the other puncture of the bladder for retention of urine. Two deaths from pyæmia occurred during the year.

In the year 1861 the only capital operation was a primary amputation of the hand, which proved successful. In 1860 there were six capital operations, viz., two of primary amputation of the arm, and three of primary and one of pathological amputation of the leg; one case only proved fatal,—a primary amputation of the leg, in which death was the result of typhoid pneumonia.

GREENOCK.

In the year 1847-48 (the year of the great fever epidemic) a large number of typhus cases were admitted, of whom 40 or 50 were attacked with erysipelas; and erysipelas and hospital gangrene prevailed at the time among surgical patients. Fever spread also among the surgical patients, and attacked nearly all the nurses and other officials. At the time referred to the infirmary and the surrounding neighbourhood were all badly drained, and the fever wards occupied the lower floor of what was at that time the general hospital. Within the last two months, two convalescent typhus cases have caught small-pox, but infectious diseases never spread from one house to the other.

This hospital has ordinarily a high mortality, but this is evidently not due to any unhealthiness in the institution itself. It is to be explained partly by the circumstance that one fourth to one third of the cases admitted are either infectious diseases (and such affections as are liable to be mistaken for them), and partly to the fact that into the general hospital many severe cases (cases, that is, likely to end fatally,) seem by preference to be admitted.

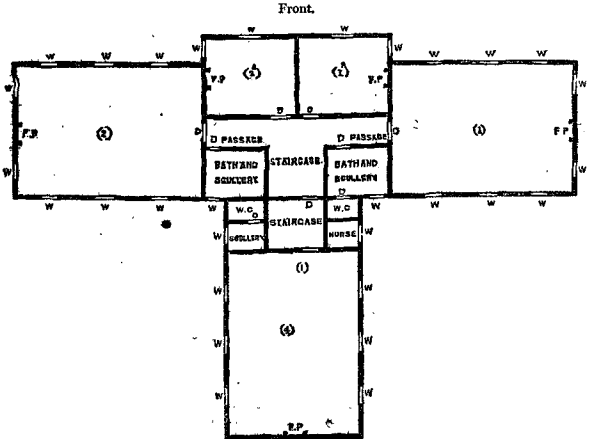
J. S. B. T. H.

MONTROSE.

MONTROSE ROYAL INFIRMARY.—This hospital stands high, on the borders of the town, overlooking the estuary on the banks of which Montrose is situated. It is provided with ample airing grounds.

The hospital has the form of the letter T, and consists of a central portion, with three wings (two lateral and one posterior) radiating from it. The central portion comprises three floors, including ground floor and attic, and contains, besides the entrance hall and various offices, the operating theatre and four wards. Two of the wards are on the first floor; they are small and very rarely used; and two, a male and female syphilitic, containing two beds apiece, are situated in the attic. The wings resemble one another almost exactly, and consist of a ground floor and of a first floor only. The two lateral wings have each one ward on the first floor; the posterior wing has two wards: one on the ground, the other on the first floor. These wards are as nearly as possible of the same size, contain 12 beds apiece, have an elevation of between 12 and 13½ feet, and a cubic capacity which allows for each bed from 720 to 730 feet. They have opposite windows, and in the two lateral wings, windows at the end as well. The windows open by sashes, and have each one pane of perforated glass. There are also ventilators in the ceilings.

Front.



MONTROSE ROYAL INFIRMARY

SCOTTISH HOSPITALS.

MONTROSE.

The wards have open fire-places, but are provided also with hot-water pipes which run round the large wards beneath gratings. They are lighted by gas. The water-closets are in the building, well drained, without bad smell, and separated from the wards. There are good bath-rooms, and an abundant supply of good water. The back wing, which has a separate staircase, contains the fever wards.

The bedsteads are of iron, and without curtains. There are both straw and hair mattresses. The floors are washed weekly; the hospital is whitewashed annually.

There is a matron, and for attendance on the sick, two resident nurses, one for the fever cases, and one for the other patients. The professional care of the patients rests with a surgeon and an assistant surgeon. There is no resident medical officer, and the medicines are served as at Arbroath.

The treatment adopted is generally stimulating. Sponges or lint are chiefly used in the cleansing of wounds.

Patients are admitted by subscribers' letters, and come from the town and the adjacent districts. They are chiefly mill-workmen, weavers, labourers, and domestic and farm servants. All classes of disease are admitted, including fever and syphilitic cases, which alone are isolated, and have special wards devoted to their reception.

The number of beds in general use is 52; of which 26 are for males, 26 for females, and of which 24 are for fever cases, four for venereal, and the remainder for ordinary medical and surgical cases. The average number of beds occupied has not been calculated, but for several years the number in the house at the time of drawing up the annual report has varied between 16 and 26.

At the time of visit the hospital was clean, and seemed thoroughly well ventilated. It contained 19 patients, of whom 10 were males and 9 females; 11 were medical cases and 8 surgical. Three of the medical cases were cases of typhoid fever; one was a case of scarlatinal dropsy, one a case of pleurisy; the others were chronic or trivial. Of the surgical, two only were important, viz., a case of amputation of the thigh for diseased knee, and one of excision of the head of the humerus for necrosis; both were doing well.

The following is a record of the total admissions for five years, with the fever cases, the deaths, the deaths from fever, and the per-centage mortality.

Years.	Total Admissions.	Total Deaths.	Total Mortality per Cent.	Fever admissions, including scarlet fever and variola.	Deaths from fever, &c.	Fever Mortality per cent.	Per-centage Mortality excluding fever cases.
1862 - -	319	19	6·	77	8	10·3	4·7
1861 - -	264	18	6·8	21	2	9·5	6·5
1860 - -	323	23	7·	72	6	8·3	6·7
1859 - -	266	16	6·	36	4	11·1	5·2
1855 - -	466	39	8·	186	22	11·8	6·

Of the 11 fatal cases due to other causes than fever in 1862, one was a case of drowning, one a case of injury to the head, one a case of amputation of the thigh, one a case of lithotomy, one a case of herniotomy, one a case of disease of the knee-joint, one a case of enteritis, and the others were cases of chronic medical diseases. Of the 16 deaths (excluding deaths from fever) occurring the year before, two were from diseased bladder, two from hæmoptysis, one from pleurisy, one from cerebral congestion (apoplexy?), and the rest from chronic medical affections.

The operations of the class selected during the three years ending with 1862 were as follows: amputation of thigh four, of which two died; amputation of leg four, of which none died; amputation of fore-arm three, of which none died; excision of elbow two, none fatal; lithotomy one, fatal; herniotomy five, three fatal.

No cases of pyæmia or of secondary erysipelas, or of phagedæna, are recorded; but, as regards the spread of infectious fevers, it appears that in the year ending June 1855, when a large number of fever and small-pox cases were admitted, the assistant surgeon, the matron, the fever nurse, her two assistants, and the cook, all contracted fever, and some had it severely. Moreover, patients recovering from small-pox took fever, and conversely. In the year ending June 1862, again, two nurses, the house-maid, and a pupil took fever. Further, in April of 1860 a patient was admitted with small-pox, and gave the disease to two of the servants and to three convalescent fever cases.

This hospital we regard as being decidedly a country hospital, occupying an excellent site, and well constructed and arranged. The mortality is high, but this is evidently from the nature of the cases admitted, which are chiefly medical, and comprise many serious cases. The surgical cases, on the whole, are neither so numerous nor so important as the medical, still they include a few serious cases demanding operation. J. S. B.

PAISLEY.

PAISLEY INFIRMARY.—The town of Paisley contains about 48,000 inhabitants, who are chiefly weavers and mill-hands. The hospital is situated at one end of the town, on the river Carte, and lies, compared with the greater part of the town itself, rather low. There is a tolerably large airing-ground for patients towards the back of the hospital.

The form of the hospital is something like that of the letter T. The front building, which faces the river, consists of three stories (including the ground floor), and the back building consists partly of two, partly of three stories. In every part of the house two floors are used for wards.

The wards are 11 in number. In the front house there are six; three on the first and three on the second floor. The arrangement is extremely simple, and on each floor the same; thus, one transverse ward occupies the centre; at either end of the building is a ward placed at right angles to this, and extending both at back and in front, beyond the central part; and uniting the transverse ward to each of the others, is a lobby, with staircase, water-closet, and nurse's room. The wards are tolerably long and broad, and from 10 ft. 6 in. to 12 ft. high. The end ones on each floor contain 15 beds, and allow about 800 cubic feet to each bed. The centre ward on the first floor holds 16 beds, and allows about 670 cubic feet per bed; but the ward over it contains only 12 beds.

The wards in the old or back house (which is approached by a separate entrance) are five in number. One on the ground floor contains 12 beds; one over this contains 14; another on the same floor contains 8; and one on the second floor over this room holds also 8. There is also another small ward containing two beds.

Ventilation is effected by means of ordinary sash windows, ventilators in the floors (allowing of the entrance of air from without), and ventilators either in the ceiling or walls (to permit of the escape of vitiated air), open fire-places, and doors. In all the wards, but the end wards of the front building, the windows are opposite and numerous; and in these latter there is ventilation at both sides, except where the wards are united to the central portion; but to make up for this deficiency there are large windows at both ends. There is no artificial heating. The wards are lighted by gas. The floors of the wards are of deal; the walls are coloured to a height of four or five feet, and above this whitewashed.

The water-closets open directly into the wards, and did not at the time of visit seem very sweet; the drainage is said to be good. There is one bath-room for the front building, and two for the back. Patients are bathed as a rule on admission. Water is laid on, and the supply *is* abundant. The beds are provided with straw mattresses, the contents of which are often taken out and destroyed. The wards are washed once a week; and the hospital whitewashed and cleansed occasionally, but not once a year.

The nurses all live in the house; four are day nurses, and the remainder are night nurses. Two physicians and two surgeons are attached to the hospital, who take duty, two and two, for 12 months at a time. There is a resident house surgeon, and at the time of our visit there were four pupils.

A good deal of local bleeding is used, especially in medical cases, but general bleeding, never. Stimulants are largely employed. Water dressing is the usual form of application, and wounds are cleansed by irrigation. No sponges are employed.

Accidents are freely admitted of course, but all other cases require a letter of introduction. Subscribers of 10*s.* 6*d.* have the privilege of admitting one fever case per annum. The applicants for admission are chiefly mill-hands, miners, agricultural labourers, and a few prostitutes. Scarcely half come from Paisley itself; the rest are furnished by the surrounding country districts. Fever cases are brought on a stretcher, but an ambulance is in course of preparation. All forms of disease are admitted.

The hospital contains 132 beds, of which 88 are for males, 44 for females, and of which 42 (placed on the second floor of the front building) are for fever cases, 23 for ordinary medical cases, and 65 for surgical. Two beds in a *small* private ward are used for special cases. There are separate wards for infectious cases; two wards (with 20 beds) for male and female syphilitics; and the ordinary medical and surgical cases are also separated from one another.

At the time of visit the wards seemed fairly clean, and capable of good ventilation, but one or two smelt close (from closure of windows, probably). 55 patients were in the hospital; 38 males and 17 females. Of these 55, eight (comprising one case of variola, three of typhus, and four of typhoid,) were in the fever wards; 17 (including six cases that might be regarded as acute or serious, viz., pneumonia, acute rheumatism, typhoid, *albuminuria*, ascites, and cancer of liver,) were in the ordinary medical wards; and 30 (including nine accidents, four acute cases, 17 chronic cases, and 16 with open sores,) were in the surgical beds. Among the surgical cases were two burns, two grave operations and two simple fractures, but no erysipelas.

The average number of patients in the house during 1862 was 48, and the average length of stay of each patient was 25·7 days. During this year 578 patients were admitted, and 45 (or 7·7 per cent.) died. Of this number, 102 were admitted as fever cases, 12 of whom died, or 11·7 per cent. 32 only were admitted as accidents without tickets.

With the exception of fever cases, the cases of disease (medical as well as surgical) do not seem to have been peculiarly severe or acute. Among the more severe cases may be enumerated, five of erysipelas, two of variola, nine of pneumonia, six of acute rheumatism, one of strangulated hernia, 11 burns, 23 fractures (including three compound). Among cases chronic but likely to be fatal may be named, 78 cases of bronchitis and 15 of phthisis. Of cases not likely to be fatal, the following are examples; 54 ulcers, 46 cases of venereal disease, and 29 cases of skin and eye affections. Of the 45 deaths in the year, 12 were due to fever, eight to bronchitis, three to anasarca, three to phthisis, two to compound fractures, one to burn, one to concussion of the spine; and the rest were single examples of various forms (acute and chronic) of medical and surgical diseases. 28 operations are stated to have been performed in the year; but

PAISLEY.

23 of them were minor operations. In the year 1861 the per-centage of deaths was 7·3; of fever cases 11·8, 98 of the latter having been admitted. 34 operations of all kinds were performed. In the year 1860 the per-centage of deaths was 6·8, and of fever cases 11·3, 106 of the latter having been admitted. 32 operations of all kinds were performed.

During these three years the following were the numbers and results of the operations of the classes selected for comparison:—

		died.
Amputation of the thigh for disease -	1	0
" leg for injury -	4	2
" leg for disease -	1	0
" arm for injury* -	2	0
" arm for disease -	2	1
" fore-arm for injury	1	0
Strangulated hernia - - -	4	1
Lithotomy - - - -	1	0
Excision of elbow - -	1	0

Fever occasionally spreads; recently the house surgeon and one of the nurses have caught it. Erysipelas and phagedæna, and pyæmia are said scarcely ever to originate in the hospital. The last case of pyæmia is said to have occurred four years ago. But post mortem examinations are rare (in the proportion, perhaps, of one to five deaths). Dr. Mackinley, one of the surgeons, says he has performed about 40 of the chief surgical operations, and lost only one case. Operations, however, are rare, the chief operation cases being carried to Glasgow.

The hospital, though a small one, and not in a large town, can scarcely be called a country hospital; still, in paucity of accidents and of operations, it resembles country hospitals. Patients are admitted chiefly by letter, and the wards are rarely crowded; yet the mortality is somewhat high; but evidently not from special hospital insalubrity.

J. S. B. T. H.

PERTH.

PERTH INFIRMARY.—The Perth infirmary is a good example of a purely country hospital on the Scotch system. There is nothing peculiar in the town, which is of moderate size (25,251 inhabitants), tolerably healthy, 24·7 per 1,000 being the yearly death-rate, with few public works, and therefore not many accidents, and with no unfavourable sanitary circumstances, except imperfect drainage in parts of the town, and this does not affect the hospital.

The institution has been founded, as is well expressed in its prospectus, to supply a place "for the reception of the poor when they meet with serious accidents, and also when "seized with epidemic or infectious diseases; a place where they would receive that "accommodation, care, and medical aid not attainable in their own humble dwellings, "and by removal to which, in the case of typhus or other infectious fevers, the spread by "contagion might in a great measure be prevented."

Accordingly the hospital, although a small institution, is not reduced to that almost total inaction which is the characteristic of some of our small country hospitals in England. There is no exclusion of any disease, except venereal affections; and though admission is given by letter, it is given at any day and at any time, and the medical officers who attend daily to see out-patients can transfer any of them at once to the wards.

The hospital, as is usual in Scotland, has attached to it not only a "dispensary" department, analogous to our out-patient system, but also a "district" department, which sends a medical officer to visit the poor at their houses, and thus performs the offices discharged in London by the union medical officer and the dispensaries, with, however, the additional advantage of direct communication with the hospital. The importance of the latter department is shown by the fact that it presents even a higher mortality than the hospital. The cases are few, and are evidently composed chiefly of persons who are too ill to leave their houses, but unwilling to go into hospital. The deaths in the year on 343 patients was 30=10·3 per cent.

Thus it seems that the Perth infirmary, like other Scotch provincial hospitals, aims at fulfilling and does successfully fulfil the duties which most of those in England decline; viz., the care of all affections, acute as well as chronic, and the attempt to check or mitigate the ravages of epidemics.

The hospital is situated on the outskirts of the town, on rising ground above the town, having the open country behind it. It was built in 1833, and is constructed on a rather peculiar plan. There is a square hall and staircase in the centre, from each side of which a block of building radiates. The two blocks, which run along the main face of the building, contain a ward in each story; and each ward is divided along the middle by a "spinal wall," as in St. Bartholemew's. Each part contains eight beds, making 64 beds in the main wards, and there are two private wards of two beds each in a third limb of the cross. The other parts of the building are occupied by the dwelling rooms and offices. The small wards are not very often used. The beds seem equally divided between medicine and surgery, but the separation is not very strict. The number admitted varies with the season. At the time of visit there were 38 patients only in the house; but the winter average is about 56. The windows and doors are the chief ventilation;

* One at the shoulder joint.

but there are also ventilating holes in the roof, and perforated zinc plates in the ward doors. In the winter it is necessary to supplement the open fires by moveable stoves. The water-closets are attached to the wards, with baths. Fever and small-pox are placed in separate wards.

There are two visiting surgeons, who see both medical and surgical cases, both among the in and out-patients. There is a day and night nurse for every two wards. They all live in the house. The treatment is chiefly stimulant and tonic; but for pneumonia and inflammatory diseases tartar emetic is a good deal used. There is no venesection, and only one cupping and a few leeches could be remembered in nine months. The dressing of wounds is chiefly by mild lotions; sponges are not often used in the wards. The wards are scrubbed once a week; the bedding is washed after an offensive case or a death.

There seem to be few acute cases, except those of fevers and of acute affections of the respiratory organs.

Taking one year, 1862, there were admitted 607 patients, and 43 died, 7·07 per cent. The medical cases were 393, and the deaths seem to have been 36, leaving only seven deaths for the 214 surgical cases. This, if correct, would give 9·2 per cent. for the deaths on the medical side, and only 3·2 per cent. for the surgical. That is, if we correctly understand the language of the report. The error, if any, cannot be great.

Operations are very rare here. Of those in the classes which we have selected for comparison, we have the following as the account for three years, accidently selected, viz., 1842, 1861, 1862.

	No.	Died.
Amputation of the thigh	3	1*
" leg	5	1.
" arm	2	1.†
" fore-arm (primary)	1*	.
Excision of the elbow	1	.
Herniotomy	3	1.

With respect to the spread of disease, it does not appear, from what we can learn, tha fever has spread in the house, though small-pox has doubtless done so. Secondary surgical affections, though not unknown, are rare. It appears, as far as verbal information and personal recollection could be trusted, that there had been neither erysipelas nor phagedæna originating in the house during nine months; but one case of pyœmia had occurred in that period.

T. H.

IRISH HOSPITALS.

BELFAST GENERAL HOSPITAL.—This hospital is situated in the northern part of Belfast, and possesses little ground beyond that on which the building itself stands. It has four floors, of which the basement is used for domestic purposes, and the three other floors are used almost exclusively for wards. The ground floor presents a large corridor extending from one end of the building to the other; opening from the centre of which, in front, are the entrance-hall, and behind the principal staircase; while the wards, nurses' rooms, &c. are placed back and front along the remainder of its length. The first and second floors (which are identical with one another) differ from the ground floor in the fact that they are not co-extensive with it, and that the end wards on either side extend from back to front, and thus limit the length of the corridors.

The hospital contains 15 wards and 107 beds. Five of the wards are on the ground floor, and hold ten, five, five, four, and four beds respectively; four are on the first floor, and contain in two instances twelve beds, and in two six beds; six are on the second floor, and four of them, as they correspond in position and size to the wards on the first floor, correspond also in the number of beds; the other two hold four and three respectively. The wards are for the most part small, and with one or two exceptions rather low; the ventilation, however, seems to be very good. In the end wards, on the first and second floors, there are windows at each extremity, and opposite to the door a large louvre communicating directly with the external air. In the other wards the windows are generally on one side only; but the wards are provided either with ventilators opening into the corridors, or with plates of perforated zinc in the place of some of the upper window panes. One ward (and this, one of the largest) had an offensive smell, but this circumstance was due to the presence in it of two cases of burn. The wards were clean; they are heated by open fire-places only. The bedsteads are of iron and without curtains. The mattresses used for fractures and some other cases are of horse-hair, but those in common use are of straw, and the straw is changed once a week. The beds generally are rather close. There is one water-closet on each floor, well drained, and tolerably clean, but opening out of the corridor, and wholly removed from the wards. There is one bath-room only for the use of the house, situated in the basement. The nurses all reside on the premises, and are eight in number: they comprise three day nurses, with an equal number of ward maids (who do the scrubbing,) and two night nurses. Extra nurses are occasionally employed. There are four physicians and four surgeons, and a resident surgeon. The floors are scrubbed regularly twice a week, and the wards are emptied and whitewashed once a year.

* The one which died and one of those which recovered were primary; the other not stated.
† Both primary; the death seems to have been connected with other injuries.

It should be added, that there are, in an old building behind the hospital, two wards containing between them 10 beds, which are occasionally used for the reception of fever or other cases when there is an excessive pressure on the hospital accommodation.

As regards treatment it may be stated that depletory measures are little, but stimulant measures largely, used; and that in surgical cases water-dressing is almost invariably employed. Sponges are used in the wards for the cleansing of wounds, but in special cases patients have sponges set apart for individual use.

Patients admitted into the hospital are for the most part mill-workers, and come from Belfast or from within a circle of eight miles radius round the city. All patients who come from beyond this distance have to pay 1*s.* a day. No cases are excluded from the hospital but those of mania or dementia. Persons suffering from syphilis or from infectious diseases are admitted on the condition that they pay 1*l.* 1*s.* per week, and those suffering from delirium tremens, provided a payment of 2*l.* 2*s.* per week is made. Patients may be admitted by letter, but the great majority of those received into the hospital apply without recommendation of any kind.

The Union Hospital for contagious diseases provides the chief accommodation in Belfast for acute medical disorders, and hence the General Hospital is chiefly a surgical hospital. Of its 15 wards seven are allotted to surgical and eight to medical cases; but the former contain 66 beds, the latter only 41; and, again, 60 of the beds are for males and 47 for females. There are two accident wards for males, a ward for female syphilitics, and special fever wards, but the latter are placed on the ground floor, and close to the accident wards.

At the time of our visit there were 21 medical cases only in the hospital (including six in the back building) and 52 surgical cases. Of the 21 medical cases, eight were cases of fever (five being distinctly typhus) and two of small-pox; there was a convalescent case of slight delirium tremens and a case of pleurisy; but all the others were purely chronic or trivial. Of the 52 surgical cases, 24 at least might be regarded as acute or serious, the others as chronic or of minor importance. Among the acute cases were included two cases of severe burn (in one of which tetanus was threatening), two of erysipelas, one of compound fracture of the leg, four of laceration, and four cases of the selected operations (all doing well), viz. a case of excision of the elbow, two cases of amputation of the thigh for disease of the knee, and a case of herniotomy. Besides the cases above specified, there were seven of simple fracture.

On looking to the records of cases published in the annual reports, we find that during the year 1862 988 patients were admitted into the hospital, of whom 76, or 7·69 per cent., died. Of these, 374, with a mortality of 48, or 12·8 per cent., were medical; and 614, with a mortality of 28, or 4·56 per cent., were surgical. In the year 1861 the mortality among medical patients was 11·7 per cent., that among surgical 7·2 per cent., and that for the whole hospital 8·8 per cent. In the year 1860 the per-centage of deaths among medical cases was 12·5, that among surgical 4·9, and that calculated for the total number admitted 7·8. The per-centages above given are high compared with those of the Dublin Hospitals. But in the first place, it must be borne in mind that this is the only general hospital in a large manufacturing town, and that patients are practically admitted without letter. In the second, it is an important school of medicine, where the exigencies of teaching naturally tend to the exclusion of unimportant cases of disease. Again, it is only just to point out (what is dwelt on in the reports) that many cases are brought to the hospital in a moribund condition. Thus, to take the year 1862 as an example, 11 of the medical and six of the surgical cases were admitted in this state. But we may go a little more into detail, and for this purpose will take the year 1861; in this year 858 medical cases were admitted and there were 42 deaths. Now among these we observe 20 cases of dropsy with five deaths, 31 of disease of the brain or paralysis with seven deaths, 16 cases of phthisis with three deaths, 16 of fever with two deaths, 24 of disease of the uterus or ovaries with four deaths, and 41 of bronchitis with four deaths. Of surgical cases admitted in the same year, we find there were 662, and 48 deaths; but on looking to the nature of the cases admitted, we find at once that 22 were cases of burn or scald, and that 12 of these died, a mortality the exclusion of which would very materially alter the total mortality and the per-centage of deaths for the year; we find also 25 cases of fracture of the skull or of concussion with six deaths, 16 of erysipelatous inflammation with two deaths, 67 cases of simple fracture with three deaths, 12 of compound fracture with six deaths, four of strangulated hernia with one death, 63 of lacerated wounds with three deaths, and 59 of diseases of joints with three deaths. These details show that the hospital really receives a very large proportion of serious cases, such as of necessity lead to a high mortality.

We were informed that pyæmia, hospital gangrene, and erysipelas (orginating in the hospital) are rare, but that early in the year 1861, for a period of six weeks or two months, an epidemic of hospital gangrene prevailed in the hospital and also in the town, and that during this epidemic almost all wounds and operation cases in the hospital were attacked, and that at least six deaths were the direct result of this. Our reason for selecting the year ending August 1861 for our analysis given above is that the mortality due to this disease occurred in the course of it, and that it increased in some measure the per-centage of deaths among surgical patients.

Capital operations seem to be not infrequent (as might be supposed for the number of accidents admitted), but their success evidently is not very great. Thus, in the three years ending August 1862, there were 17 amputations of the thigh of which 12 were fatal, 13 amputations of the leg of which three were fatal, seven amputations of the upper arm of which one was fatal, nine of the forearm of which none was fatal, three cases of excision of the knee of which one was fatal, and one fatal case of excision of the shoulder.

Besides these there were 13 operations for strangulated hernia, in four of which there was a fatal result, one case of lithotomy which proved fatal, and 13 successful cases of excision of the mamma. It may be added, that although pyæmia is said to be rare, post-mortem examinations are very seldom made or permitted to be made; eight or ten a year is probably the average. J. S. B.

The ADELAIDE HOSPITAL is situated in Peter Street, a central part of Dublin It forms one of a row of houses, and is enclosed on nearly all sides by high buildings. In front it abuts on the street; behind there is a small yard, at the extremity of which a fever house has been erected.

The hospital itself differs little from a large private house, and with the basement presents five floors, of which the three upper are used for the reception of patients. On the first floor there are four wards,—a children's surgical ward, with 15 beds, a children's medical ward, with six beds, and two wards for pay patients (male and female respectively), with four beds each. Each children's ward is provided with a bed for a nurse. On the second floor are three male wards,—two for surgical patients, with 16 and six beds respectively, and one for medical patients, with 10 beds. On the third floor are the female wards, also three in number, and corresponding exactly in size and in use with those on the floor below, but containing two beds less. The fever house has one floor only, and two wards, respectively male and female, with four beds each. The whole hospital contains, therefore, 99 beds, of which 40 are set apart for males, 38 for females, and 21 for children, and of which 58 are appropriated to surgical cases, 33 to medical cases (including fever), and eight to paying patients, who may be either medical or surgical. The wards vary in size, and are not overcrowded; indeed, the beds are in many cases a considerable distance apart, and the space allowed to each ranges from about 620 to upwards of 1,100 cubic feet. The smaller capacity exists only in the children's surgical ward. The hospital is well ventilated, although in almost all the wards, except the fever wards, windows are situated on one side only. The windows are all of them tolerably large, and open in some instances by sashes, in others in three horizontally revolving segments. All the ceilings are provided with several large ventilators, communicating, between the floors, with the external air. There are also openings of communication between wards and the adjacent corridor, and there are open fire-places. On each floor there are two water-closets, one objectionable, as it has no ventilation except into the corridor, the other in all respects satisfactory. There are bath-rooms on the upper two floors. The fever house is small, consisting of two wards separated by a central passage, above which the wards communicate freely with one another. There is a water closet to each, somewhat objectionably placed.

The entire establishment appeared to be clean and well kept. There are eight nurses and two night nurses resident in the house, and a ward maid for each floor. The ward maids do the scrubbing. There are two physicians and four surgeons, of whom the former take duty alternately for a month, and the latter take duty two and two for a similar period. The resident officials are two pupils. Depleting measures are employed scarcely at all; stimulants abundantly. Tow and water-dressing are used in the surgical wards.

All forms of diseases are admissible into the hospital. But very few accidents or serious surgical cases apply, and all others (by far the greater number) are admitted solely by governors' letters. A considerable number of beds have in fact the names of governors inscribed over them, and are devoted to the reception of the nominees of such governors. When one considers this latter fact, and, further, that eight beds are for the reception of patients that pay, and that the institution itself is essentially Protestant, it is obvious that the class of patients admitted must differ much from the classes received into free hospitals. Patients are not limited as to the duration of their sojourn in the hospital; but the average stay of each for the year 1862 was about 24 days. The average daily number of patients in the house during the same year was 64, viz., 26 in the medical wards, and 38 in the surgical wards. In the course of the year 968 patients (430 men, 373 women, and 165 children) were admitted, and 57 (24 men, 22 women, and 11 children) died. The per-centage of deaths was therefore 5·9. This per-centage, considering the character of the cases admitted, may appear large; but on analysing the deaths, it appears that 40 were of medical cases, 12 of surgical, and the other five of cases suffering from affections not specified; and that of the 40 specified deaths in medical cases, eight were the result of tubercular diseases, five of hydrocephalus, six of fever or scarlet fever, and the others mostly of chronic diseases; and that of the 12 surgical deaths, with the exception of one after the operation for strangulated hernia, one from diffuse inflammation, and one from disease of the testis, all or nearly all were due to affections of a chronic character.

Capital operations are evidently very rare. We discovered the records of 12 operations only performed during the year 1862, of which one (the case of strangulated hernia before referred to) died. The others, not fatal, were excision of breast for cystic sarcoma, removal of cancer, amputation of penis, lithotomy in a child, Syme's amputation of the foot for caries, Wood's operation for radical cure of hernia, and two or three quite minor operations. Pyæmia and erysipelas are said to be rare. This is not remarkable, considering the paucity of operations; but, nevertheless, we were informed that there had certainly been six deaths from pyæmia since the opening of the hospital in 1858.

At the time of visit there were 71 cases in the house—31 medical, and 40 surgical. The medical, with the exception of those in the fever house, were chiefly chronic or unimportant. In the fever house were four cases of typhoid and one of typhus fever, two of scarlet fever, and one of diphtheria. Of the few acute medical cases in the general

hospital one was a case of slight delirium tremens, and two were cases of acute rheumatism. Of the 40 surgical cases, two only could be regarded as acute, viz., a case of erysipelas of the face, and one of phlebitis, and five operation cases, including a case of amputation of the leg for disease of the knee. There were also four cases of accident, including a burn and a simple fracture. There were about 16 open wounds.

Clinical instruction is given systematically here, as in fact it is given at every one of the general hospitals of Dublin. J. S. B.

CITY OF DUBLIN HOSPITAL.—This institution lies to the south-east of Dublin, on the confines of the town, and away from the manufacturing and labouring population. It is situated in a street, forms one of a row of houses, and has small grounds both behind and in front, the former only being used as an exercise ground for the patients.

The hospital was originally a schoolhouse, and presents therefore many of the features of a private residence, but it has been added to and altered from time to time. It is a compact but somewhat irregular building of four floors (including the basement), of which the upper two alone are used as wards for patients; the lower of the two floors being devoted solely to male patients, the upper of the two floors to females and children. The ground floor contains the sitting rooms of the resident officers, the dispensary, and other offices.

The wards are 11 in number, and vary a good deal both in height and in their other dimensions; but in superficial extent the wards on the upper floor are almost the exact counterpart of those on the floor below. The height of the wards is for the most part ample; the wards themselves are of moderate size, and contained at the time of visit from three to 10 beds apiece. Heating is effected by means of open fire-places, and lighting by gas. Ventilation depends upon open doors and fire-places, a few ventilators in the walls, communications in the upper parts of the walls between contiguous wards or between wards and the staircase, and upon ordinary sash windows, which are few in proportion to the size of the wards, but which individually are large, and reach to within a very short distance of the ceiling; they are generally open, and, as the wards are periodically and frequently cleansed, the hospital appeared to be, and we believe is, both clean and fairly ventilated. There is a bath-room and water-closet to each floor, but they are wholly unconnected with the wards, and are in all respects unexceptionable. The duties of the house (as relates to patients) are performed by seven visiting medical and surgical officers, who attend daily at an early hour, and by two resident pupils, who attend to the apothecary's and surgical departments respectively. There are three nurses, three ward maids, and a night nurse, resident on the premises, one of the nurses sleeping in the children's ward.

The number of beds in the hospital appears to vary, a larger number being placed in the wards in winter time and during session than at other periods of the year. At the time of our visit there were 77 beds in the wards, of which 35 were for men, 36 for women, and six for children. Of these, 11 (six male and five female) were devoted to eye cases alone, six to special female diseases, and the rest to general medical and surgical cases; two of the male wards were looked upon as purely surgical wards. The bedsteads themselves were of iron, and generally without posts or curtains, but latterly posts and curtains have been provided for some of the female wards. The beds were all far apart, and, as a rule, a very large cubic space must be allotted to each bed.

There were in the hospital when we visited it 48 patients, of whom 21 were men, 23 women, and four children. Seven of these were in the eye wards and four in the special female ward. Of the remaining 37, 15 were under the care of the physicians, and 22 under the care of the surgeons. Of the former, two were acute and 13 chronic. Of the latter, four were acute, three were cases of accident, and 15 were chronic; they comprised a case of removal of the testicle for cancer, a case of Teale's amputation of leg for disease, two cases of compound fracture in one of which sloughing had ensued, a case of bursitis followed by diffuse inflammation, and a case of erysipelas.

The medical and surgical records of the hospital seem to be somewhat imperfectly kept, but so far as we could learn by examining them, and by enquiry, it appears that pyæmia, erysipelas, and phagedæna seldom, if ever, break out in the hospital, and that infectious medical diseases never spread among the patients, and that deaths are few. The examination of the records showed that during a period of 20 years, ending with 1852, 9,394 patients had been admitted, of whom 540, or 5·8 per cent. had died; and that during the year 1862 (which we selected for the sake of instituting a closer analysis) 612 cases had been admitted, and 28, or 4·5 per cent., had died. The average number of deaths is small; but, on looking to the cases admitted, we found that 75 of the total number were eye cases, and that 99 only (including cases of diseases peculiar to women) had been treated by the physicians of the hospital. Again, it appeared that seven operations only had been performed, viz., two for strangulated hernia, of which one was fatal, and one of removal of tumour from the head, one of amputation for compound fracture of the arm, one for recto-vaginal fistula, one of laryngotomy, and one for some disease of the eye, all of which were successful, or perhaps not fatal. Further, it is worthy of remark that, with the exception of accidents and surgical cases, all patients are admitted by (although letter the medical officers have and use a discretionary power of admitting or refusing all applicants); that this hospital is not in the midst of the poor population; that infectious cases rarely apply, and are only admitted in small numbers for the sake of clinical instruction; and that incurable cases are as a rule excluded. Taking all these circumstances into consideration, it is easy to understand that (putting out of the question the general healthiness of the hospital, which is doubtless a fact,) the mortality of the hospital should be small, and that it should enjoy considerable apparent healthiness.

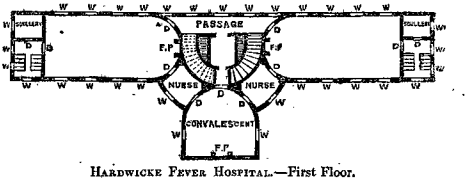
We may add to the above that in the treatment of cases stimulants are largely used, depleting measures rarely; and that in the treatment of wounds water-dressing, and in the cleansing of wounds tow, are generally employed. J. S. B.

HOUSE OF INDUSTRY HOSPITALS.—HARDWICKE, WHITWORTH, AND RICHMOND.—These hospitals, close together and under one management, constitute the largest institution in Dublin for the treatment of the sick and injured poor. They are situated in the north-western part of the town, and in the centre of a large poor population; but they stand high, and possess extensive grounds. They contain between them 270 beds (or when, as happens occasionally only, a supplemental fever house is in use, 332). All classes of disease are admitted; men and women are received in nearly equal proportions, and infants even are not excluded. Patients are admitted daily, at all hours, without letters of recommendation; they consist essentially of the ordinary labouring population, and, to speak somewhat roughly, two-thirds of the total number admitted belong to the city. Out-patients are not seen as in the London hospitals; but of the applicants for admission, those for whom there is no room, or whose cases are trivial, are examined and prescribed for in the "externe room," but are not provided with medicines. There are four physicians and four surgeons, who divide the duties of the hospital between them, and attend daily between eight and twelve A.M. There is also a resident apothecary, who has, however, nothing to do with the charge of the patients; this duty, in the absence of the visiting medical officers, being intrusted to resident pupils, of whom five (two medical and three surgical) dwell on the premises. The hospitals are in connexion with a school of medicine, and furnish clinical instruction to a large class of medical students. There are in each hospital four nurses and a night nurse, together with four "ward-maids," who scrub the wards, and occasionally assist in the nursing; all live in the house. Extra nurses are provided when requisite. The wards are scrubbed frequently, and whitewashed and cleansed once annually. During the annual cleansing the wards of the Whitworth Hospital are successively emptied, but the pressure on the other two hospitals is such that a perfect clearance is rarely possible. The diet allowed to patients is good, apparently, and a large proportion of stimulants is given. The drainage of the hospital is good, and the water supply is excellent and abundant. The bedsteads are of iron, and, except in the Richmond Hospital, without posts or curtains. In the female division of the Whitworth Hospital, however, there are horizontal iron bars between each bed, to which curtains may be and frequently are attached. In the Hardwicke Hospital the mattresses are of straw, and are very often taken to pieces and cleansed, and have their contents destroyed; in the other hospitals the mattresses are of horsehair. There is a bath-room on each floor in the Richmond Hospital, one bath-room for the whole of the Hardwicke Hospital, and in the Whitworth the only baths are moveable ones.

The HARDWICKE OR FEVER HOSPITAL, though adjoining the Whitworth, stands on its own grounds, and the patients received into it are perfectly isolated from those in the other buildings. It consists of two stories besides the basement, the former being alone and exclusively devoted to the reception of the sick. On each of these floors there are three wards, radiating, two laterally and one backwards, from a central part which contains the entrance-hall, staircases, &c.; and wedged in as it were in the angle between this central part and the three wards are two small nurses' rooms. The lateral wards on

Hardwicke.

Front.



HARDWICKE FEVER HOSPITAL.—First Floor.

the ground floor are 49 feet long, 20 wide, and 15 feet 8 inches high and as they contain 17 beds each, each bed has a cubic space allotted to it of about 900 feet; the lateral wards on the first floor are 11 feet high only, and contain 16 beds apiece; hence, as their other dimensions correspond with those of the wards below, the cubic space per bed is about 670 feet. The back wards are much smaller, and contain six beds each only. The total number of beds therefore is 78, of which 40 are for males and 38 for females. Ventilation is effected in all the wards by doors, open fire-places, small ventilators in the walls for admitting and discharging air, and by opposite sash-windows reaching nearly to the ceiling. One of the upper panes in each window and two of the upper panels in the doors are replaced by plates of perforated zinc. The plates in the windows are rather "punched" than ordinary perforated plates, inasmuch as they are plain plates of zinc which have had circular holes one-twelfth of an inch in diameter punched in them, at intervals of half an inch, in such a manner that the ragged edges resulting from the punctures all point outwards, and tend by their form to prevent the entrance of rain. The wards are heated by fire-places only, and lighted by gas. There is no watercloset in the building; convalescent patients are forced, therefore, to make use of a closet in the yard.

At the time of visit the wards seemed to be sweet and well ventilated, except perhaps the back wards, which have, in proportion to their size, a small amount of window-space. The walls of the wards, however, were rather dirty. The beds were very close, being in many cases not more than two feet apart.

The ground floor of the hospital is occupied by male cases, the first floor by female patients; the front wards are devoted to diseases in the acute stage; the back receive the convalescents from the front wards. The hospital was very full when we visited it, and the great majority of the cases in it were cases of typhus. In ward (1) 16 beds were occupied and one was empty; but two fever cases had been just admitted, to make room for whom one of the convalescent patients was to be removed to the back ward. In ward (2) there were 16 patients, and in the convalescent ward five. In ward (3) there were 16 patients; in ward (4) 16, and in the second convalescent ward two. So that the hospital contained 73 patients, 39 males and 34 females, of whom 62 (including convalescents) were suffering from typhus, three from typhoid, three from scarlet fever, one from erysipelas, two from acute rheumatism, one from bronchitis, and one from abscess in the neck. One of the typhus cases had been a short time previously in the hospital with typhoid, had been discharged well, and was re-admitted in three or four days with typhus, which had doubtless been contracted in the hospital.

In the year ending March 31st, 1862, 1,129 cases were admitted into this hospital, and 1,142 cases were treated to a termination, of whom 93 died. There was a mortality, therefore, of 8·14 per cent. In the three previous years the per-centage was 9·95, 7·95, and 9·4. The cases admitted include those of all infectious diseases, but the hospital receives also every form of acute medical affection, and some cases even that are not acute. Hence, on looking to the published report, we find that out of the 1,129 cases admitted in the year ending March 31st, 1862, there were only 495 cases of fever (including in this term typhus, typhoid, and febricula), 67 cases of scarlet fever, 22 of measles, and five of variola; and that 112 were cases of bronchitis, 81 cases of rheumatism, 54 of pneumonia (?), 27 of phthisis, 19 of dyspepsia, 17 of tonsillitis, 12 of diarrhœa, 10 of delirium tremens, 10 of erysipelas; and that the remainder comprised diseases of every variety, including a few surgical affections and even cases of itch and phthiriasis. It is obvious, therefore, that this hospital cannot be unconditionally compared either with a pure fever hospital on the one hand, or with an ordinary general hospital on the other; for although it admits a large yet very variable proportion of fever cases, it admits a still larger number of medical diseases of other kinds; and, again, although it admits almost all the medical diseases of the nosology, it is clear that these consist in a preponderating degree of cases specially acute, and therefore probably dangerous.

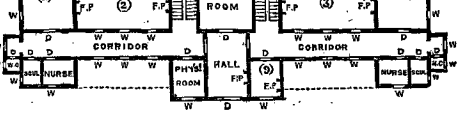
Among the 93 deaths above referred to, 46 were due to fever, six to scarlet fever, one to variola, 11 to bronchitis, 8 to pneumonia (?), and two each to peritonitis, phthisis, and pleurisy.

We do not learn that diseases spread either to the other hospitals or to officials.

Whitworth.

The WHITWORTH HOSPITAL, like the Hardwicke, consists of three floors, inclusive of the basement. Of these the upper two are used as wards. An unimportant difference between the two hospitals is that the medical externe patients are seen in this hospital, and that a room is devoted to the purpose. The hospital consists of a single building, with a long corridor, interrupted in the centre (on the ground floor by the entrance hall, on the first floor by the matron's room). On one side of this corridor the wards are situated in juxtaposition, on the other side the corridor opens at intervals into small rooms, and in the intervening situations has windows communicating directly with the external air. The

Male Wing. Female Wing.



FRONT

WHITWORTH HOSPITAL.

corridors, therefore, are well ventilated, light, and cheerful. The hospital is quite symmetrical, and the wards on the first floor correspond exactly to those on the ground floor. Exclusive of one small ward for one bed placed near the entrance, there are eight wards, two on each floor in each wing, the four in the right wing being used for male patients, the four in the left wing for female patients. The wards are small, and contain 10 beds each, which, especially in the end wards (1, 4, 5, and 8,) are very close to one another. There are, therefore, 81 beds of which 40 are for males, 40 for females, and one for any special case. The height of the wards is ample—12 feet 9, and the length and breadth of the extreme wards 30 feet and 20 feet. The ventilation of the wards is effected by doors, open fire-places, windows, ventilators

in floors and walls, and in the case of some wards by louvres communicating with the corridor. The doors, as in the Hardwicke Hospital, have in their upper part perforated zinc plates; and punched zinc plates also replace one of the upper panes of each window. The windows, with the exception of those in one ward, are sash windows; in the exceptional case, the windows consist of three equal parts, of which the two upper revolve inwards upon their lower margin. The tops of the windows are about two feet from the ceiling. The windows are placed on two adjoining sides of the end wards, but on one side only of the other wards, which alone are provided with louvres. The warming of this hospital is effected by means of fire-places, and gas is used for illumination. There are four water-closets, two on each floor, at the two extremities of the building, clean, well ventilated, and well removed from the wards.

The wards at the time of our visit appeared to be clean, and were free from bad odour; they were coloured up to about three feet from the floor, and above that white-washed. They contained very nearly their full complement of patients, the actual number being 71, of whom 38 were males, 33 females. The cases comprised some of undoubted interest, such as one of suspected disease of the supra-renal capsules, three of rheumatic pericarditis, one of facial palsy, one of femoral aneurism, one of acute rheumatism, and one of erysipelas of the leg; but the remainder were chiefly chronic, including, however, 34 cases (such as phthisis and heart disease) of a grave character.

In the year ending March 31st, 1862, 1,028 patients were admitted, and 1,026 treated to a termination, of whom 63, or 6·14 per cent., died. The average for this year seems to have differed little from that usually observed in this hospital, since for the three years immediately preceding the per-centage of mortality was respectively 5·85, 6·20, and 6·84. On looking to the statement as to the cases admitted, it seems that 133 were cases of bronchitis, 52 of dyspepsia, 90 of rheumatism (acute and chronic), 30 of anæmia, 19 of albuminuria, 48 of dropsy, 32 of cardiac disease, 11 of apoplexy, 15 of paralysis, 14 of epilepsy, and 13 of delirium tremens. There were also numbers of other diseases in different proportions, including a considerable number of skin diseases, and even a tolerable sprinkling of surgical cases. Among the causes of death, the following would appear to be the chief: dropsy, which was fatal in seven instances, heart disease in five, bronchitis in six, albuminuria in five, apoplexy in three, and cancer in five. The above numbers have been cited as furnishing some kind of notion of the cases generally under treatment in the house; but the records from which they are taken, though published annually under the Board of Superintendence of the Dublin Hospitals, are exceedingly untrustworthy and inaccurate. It would seem, however, that (with the exception of infectious cases and a considerable number of other acute cases which are taken to the Hardwicke Hospital) cases are admitted as they apply, without any special selection, that the unimportant cases are soon discharged, but that the more serious ones and those likely to be fatal are retained, and that in this way the mortality of the house is kept at a moderate standard. The hospital leaves really little to desire on the score of cleanliness, ventilation, and good management, and generally on the score of salubrity; and it is perfectly certain that the mortality among the cases must depend inappreciably, if at all, on any insalubrity or defect in the hospital itself.

The RICHMOND OR SURGICAL HOSPITAL is the most objectionably placed, and by far the most ill-constructed hospital of the three. It abuts on and faces a somewhat noisy street; it has houses on each side of it, and was originally a dwelling-house, which has been altered and adapted to its present purpose. We may add that it has been long condemned, and its reconstruction is in serious contemplation. The wards are very various in size, and contain from 17 to 5 beds apiece, except two small operation wards, which hold three beds each only. They vary in height also, but are generally low. The only means of ventilation are those employed in the other two hospitals, namely, windows and doors provided with perforated zinc plates, and open fire-places, and in some of the upper wards ventilators in the ceiling. The windows are very variously arranged, sometimes being opposite to one another, sometimes irregularly distributed on three sides of a ward, and sometimes placed on one side only, in which latter case there is always a small window in addition communicating with a corridor. Ventilation is doubtless imperfect, and at the time of our visit several of the wards had a close unpleasant odour, which was not due to want of cleanliness. The beds are generally placed too near one another, some not being more than one and a half feet apart. On the first floor there is one watercloset (with a bath-room adjoining) which is of bad construction, ill-ventilated, and produces an ill smell in the passage. On each of the other floors the watercloset is situated also at the side of the bath-room, and has no ventilation except into the corridor. The hospital has three floors. The first is used almost exclusively for wards, of which it has five. The second is also devoted to wards, of which it has four. And the ground floor has also four wards. Altogether the hospital contains 13 wards, of which seven are for males, six for females, and 110 beds, of which 75 are for males and 35 for females. At the time of visit the hospital was very full, and contained 99 patients, seven of the female and four only of the male beds being empty. The cases comprised 24 accidents, 14 acute cases and 61 chronic. Among them were nine simple fractures and eight burns, and one or two cases of minor operations. Richmond.

On looking to the published report it appears that in the year ending March 31st, 1862 1,188 cases were admitted into the Richmond Hospital, and 1,191 were treated to a conclusion, of which 42, or 3·5 per cent. died. The per-centage of deaths for the three previous years was 2·92, 2·24, and 2·4. The proportion of deaths was therefore somewhat higher in 1862 than it had been previously. The cases admitted into the hospital are very various; thus it appears from the reports that there were 112 cases of primary or secon-

dary syphilis, six of gonorrhœa, 27 of orchitis, 14 of hydrocele, 77 of eye diseases, 97 of skin affections, including lupus and anthrax, and 23 of onychia; 35 cases of erysipelas are also said to have been admitted, 97 fractures, 59 wounds, six cases of calculus, 14 of hernia, 10 of scald or burn, and nine of concussion. Of the deaths five were due to burns or scalds, two to strangulated hernia, two to concussion, and one to erysipelas.

The published records of this hospital are as untrustworthy as those of the Whitworth and Hardwicke Hospitals; further, there is, we believe, no record kept showing the frequency of occurrence of pyæmia and other secondary diseases. Records of surgical operations, again, are not preserved, except it may be by one or two surgeons of their own particular cases. We are unable, therefore, to give any definite information with regard to operations or their results. The cases admitted are evidently very various, and some (perhaps a considerable number) are of a serious nature. A fair number of operations, therefore, are doubtless performed. And, so far as we can hear, pyæmia and erysipelas, although occasionally occurring, are not frequent, and the hospital itself is considered as a not unhealthy one.

As regards treatment it should be observed that both sponges and tow are used in the wards in cleansing sores, and that water-dressing is commonly employed in the dressing of wounds.

J. S. B.

JERVIS STREET HOSPITAL.—This, like several others of the Dublin hospitals, is simply an adapted private house, but has had a supplementary portion thrown out behind. There is an entrance hall of moderate dimensions, at the back of which is the staircase. In the front house there are four stories, of which the upper two only are used for wards. In the posterior block there are also two floors used as wards. The wards are five in number. The largest (the male accident) is the lowest ward of the posterior block; it is lighted and ventilated by opposite windows, and contains 17 beds. Over the anterior half of the last is the medical male ward, containing eight beds. In the front portion of the building, on the lowest occupied floor, are two wards, one a female medical with six beds, the other a chronic male surgical (consisting really of two rooms communicating by a door) with 14 beds. The remaining ward is on the floor above, corresponding almost exactly to the compound ward last described, and holding, like it, 14 beds. All these wards are small and low, and have one or two windows at back and front. The bedsteads are of iron, and too near to one another. The wards were not very clean, and some smelt decidedly close. The heating of the wards is effected solely by open fire-places. The floors are oiled. The waterclosets are somewhat objectionably placed, and not very sweet. The nursing is done by the Sisters of Charity, with ward maids under them. There are two physicians and seven surgeons, who take duty, as usual in Dublin, in rotation.

The hospital is in the centre of Dublin, in a street with houses on both sides, but with a large open space in front, due to the presence of a disused graveyard. From its position the hospital is said to receive an unusually large proportion of accidents. Many cases are admitted by letter. The only cases actually excluded are cases of infectious fevers.

The hospital contains 59 beds, of which 14 are medical, 45 surgical, and of which 39 are assigned to males, 20 to females. At the time of our visit there were 53 patients in the building, of whom 13 were medical and 40 surgical. The medical cases, with the single exception of a case of anasarca after scarlet fever, were purely chronic. The surgical, on the other hand, contained a fair proportion of serious and acute cases. Thus, out of the 40 cases mentioned above, four were cases of fracture (three simple of the thigh, one compound of the tibia, doing well); one was a case of gun-shot wound of the hand; one was a case of strangulated hernia; one a case of scald; one a case of concussion; five were cases of wounds, in two of which erysipelas had supervened; one was a case of superficial gangrene, from too tight bandaging out of the hospital; and another one a case of idiopathic erysipelas. The remaining cases were all more or less chronic. The operation cases in the house were a case of amputation of hand for gun-shot wound, a case of herniotomy, and a case in which some minor operation had been performed. We were unable to consult any of the hospital statistics, and all we learnt was that the institution was considered by the physicians and surgeons to be a healthy one.

J. S. B.

MATER MISERICORDIÆ HOSPITAL.—This hospital, founded in the year 1861 by the Sisters of Mercy, and as yet incomplete, lies to the north of Dublin, on the confines of the town; it occupies an elevated site, and is surrounded by large open spaces. On the score of salubrity, the site seems wholly unobjectionable.

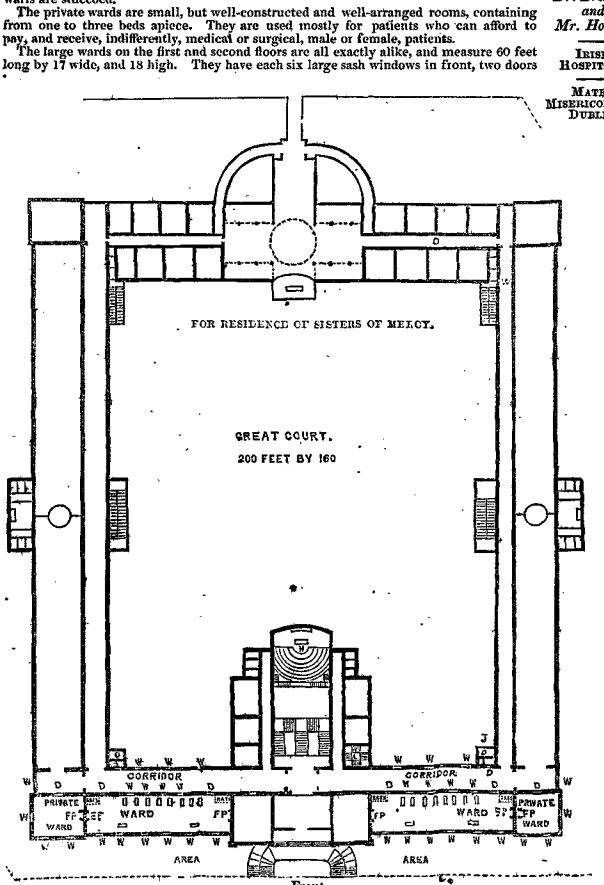
The hospital, when completed, will form a quadrangular building, and will hold, we believe, about 500 beds. At present, the anterior portion only is in existence. This is a handsome symmetrical three-floored building, presenting on each floor a corridor, at the back, extending from end to end, with wards and other rooms opening out of it in front, and with staircase, operating rooms, and offices (forming a compact block) extending from its central part backwards.

The first and second stories are about 18 feet high. The ground floor is considerably lower. The corridors are broad (8 or 10 feet), clean, cheerful, well ventilated, with handsome arched roofs, with large windows at each end, numerous large windows behind communicating with the external air, and many small windows in front, just below the ceiling, opening into the wards. The staircase is large and imposing, and on each side of it, but separated from it by a wall, is a passage, leading (on the first floor) to the operating theatre and lecture room, and to one or two small rooms. The central part of the hospital, anterior to the corridor, and corresponding pretty accurately in lateral extent with the posterior projection, is devoted, on the ground floor, to the dispensary and out-patient department, and on the first floor to an entrance-

hall, and two small rooms not used as wards. The wards are 15 in number—six large and nine small. The large wards, of which there are two on each floor, occupy the wings. The nine small wards, which are considered private wards, are, with the exception of one, placed in a line with the larger wards; two are on the ground floor at the opposite extremities of the building, and two on the first floor and two on the second floor are similarly situated; two others on the second floor are placed at the inner extremity of the large wards; and the ninth is a small room in the back building. The walls are stuccoed.

The private wards are small, but well-constructed and well-arranged rooms, containing from one to three beds apiece. They are used mostly for patients who can afford to pay, and receive, indifferently, medical or surgical, male or female, patients.

The large wards on the first and second floors are all exactly alike, and measure 60 feet long by 17 wide, and 18 high. They have each six large sash windows in front, two doors



Front.

MATER MISERICORDIÆ HOSPITAL, DUBLIN.—Principal Floor.

IRISH HOSPITALS.

MATER MISERICORDIÆ, DUBLIN.

behind, one at each end, opening into the corridor, and between them, just below the ceiling, four small windows also communicating with the corridor. There is a fire-place at each end; and between the door and the extremity of the ward at one end a press for patients' clothes, at the other end a bath surrounded by a fixed wooden screen. These wards contain only 10 beds (of which two are cribs). The eight beds are placed in a row, with intervals of about four feet between them, on the side of the ward facing the windows; the cribs are placed on the opposite side. The wards on the ground floor are like those just described, but shorter and lower, and each contains in consequence six beds and two cribs only. But their arrangements in all other respects are precisely similar. The bedsteads are of iron. There are on each floor two water-closets (besides some in the back building) for the use of the patients. These are clean, well drained, and well ventilated, and open out of the corridors in the angles which will be formed by the completion of the plan of the hospital.

Two physicians and five surgeons are attached to the institution. The hospital is under the management of the Sisters of Mercy, who provide from their own body the nurses of the establishment. There are seven of these nurses, together with nine ward majds.

The hospital is kept scrupulously clean, and its ventilation, and indeed all its internal arrangements, seem admirable.

Of the six large wards, three, comprising 28 beds, are used for men, and three, also comprising 28 beds, for females; four of the wards and 36 beds are used for surgical patients, and two of the wards and 20 beds for medical. The private wards, containing between them 17 beds, are, as before stated, used indifferently for either sex, or for any form of disease.

At the time of our visit there were 55 patients in the hospital (including nine in the private wards); of these 29 were male, 26 female, 23 were medical, and 32 surgical. Of the 23 medical cases, one (in a private ward, and accidentally admitted,) was a case of typhus, one a case of convalescence from pneumonia, one a case of pleuritic effusion, associated probably with phthisis, four others were cases of heart or of renal disease, and all the others were trivial or quite chronic cases. Of the 32 surgical cases, six might be regarded as acute, including two of simple fracture, one of compound fracture, a case of erysipelas, and a burn; 26 were chronic or trivial cases, including ulcers of leg, diseases of eye, and chronic inflammation of joints. There were two cases in which operations had been performed, both doing well, viz., a case of amputation of the leg, and one of a purely trivial character.

Patients are admitted without any recommendation other than the fitness of the case for admission, and all classes of disease are eligible except infectious fevers. Few cases of accident or of emergency apply, and operations are not numerous. Operation cases, however, it is reported do well. Secondary diseases, medical and surgical, are said to be unknown. The number of cases admitted into the hospital during 1862 was 578, and there were 21 deaths; the mortality was therefore 3·6 per cent.

This hospital promises, in our opinion, to be, when completed, one of the finest hospitals in Europe. It is built on the corridor plan; but the distribution of corridors and wards, and beds, is such as entirely to neutralize any ill effects that could possibly flow from the adoption of this plan, while all the advantages that spacious, cheerful, well-ventilated corridors afford are thoroughly secured. The only valid objections which can be raised against the building are, we conceive, those that equally hold in the case of the Hôpital Lariboisière, viz., expensiveness of construction and lavishness as regards space.

J. S. B.

DUBLIN. MEATH.

The MEATH HOSPITAL, which is the hospital for the county, lies to the south of Dublin, quite on the outskirts, 65 feet above the level of the river. It stands on rather more than three acres of ground, and has nothing whatever around to obstruct ventilation. The hospital is a compact building, presenting (with the basement) four floors, of which the ground floor partially, and the upper two floors totally, are devoted to the reception of patients.

The hospital is divided somewhat unequally (on each floor) by a well-ventilated corridor, out of which the wards open front and back. The corridor at its centre communicates with a staircase which bisects the posterior half of the hospital, and winds round a lift for patients, food, and other purposes.

On the ground floor there are two accident wards with seven beds each, one on each side of the entrance hall; a male surgical ward with nine beds, at the back of the house; and two private wards (generally used for paying patients) with two beds each; one being for males, the other for females. On the first floor there are five wards, besides nurses' and other rooms. Of these, four are surgical and one medical, and they contain 11, 10, 9, 5, and 5 beds respectively. On the second floor there are six wards, all medical. One with 10 beds in the centre, for chronic medical cases, and the rest holding respectively 10, 10, 5, 5, and 5 beds, devoted to the reception of fever cases. The fever wards are separated as far as practicable from the others.

The wards generally are small and low, but clean and free from ill smell. Most of them have windows only on one side, but some of the wards at the corners of the building have a window on each of two contiguous sides. They have generally two ventilating holes communicating with the corridor. A few have ventilators in the floor or wall communicating with the external atmosphere, and those that are without such ventilators have plates of perforated zinc let into the windows. Open fire-places and gas are employed. The bedsteads in some of the wards appeared too close to one another. They are of iron, and, except in the ward for chronic male medical cases and in the private wards, without posts or curtains. Straw mattresses are commonly employed, and they are very frequently emptied; but hair mattresses are used occasionally, especially for

surgical cases. The wards are scrubbed regularly twice a week, and the hospital is whitewashed and thoroughly cleansed once a year, but the wards are not emptied completely. The water-closets are good and well situated. There is one bath-room for the use of the whole house. The nurses all dwell on the premises. There are six day nurses, with six ward maids and a night nurse. The staff of the hospital comprises two physicians, who take duty alternately for three months at a time, and six surgeons, who take a month's duty each in turn. The resident staff consists of an apothecary and a resident surgical pupil. As regards treatment, stimulants are largely employed; depletion very rarely. Sponges are generally employed in the wards in the cleansing of wounds, and water-dressing (often with the addition of chloride of lime or Condy's solution) is the usual kind of dressing which is had recourse to.

The fever department of the hospital is intended, not for the city of Dublin, but for the county of Meath, and all fever patients from the country applying for admission, as well as all cases of surgical accident, are admitted at any time without letters; but other applicants have to present themselves at 9 A.M. with letters of recommendation from subscribers. Patients of all ages are eligible for admission, and no classes of disease except the venereal are excluded.

The hospital contains 112 beds, of which 68 are for male patients and 44 for female; and they are appropriated thus: 58 are for surgical cases, 35 for fever cases, 15 for chronic medical complaints, and four for private patients, medical or surgical. Occasionally cases of erysipelas are removed into these latter wards.

At the time of visit there were 77 cases in the house, of which 44 were male, 33 female; and of which 34 were medical (including fever) and 43 surgical. Of the medical cases, 22 were acute, including two cases of acute rheumatism and 18 of fever; and 12 were chronic, including eight cases of visceral disease. Of the surgical cases, nine were cases of accident, including six simple fractures, a compound fracture, and a burn; six were acute, including three amputations of the thigh, and one of the leg, all for disease, and an operation for hernia; and 28 were chronic, or as regards danger to life trivial.

Eighty was the average number of patients in the house during the year ending March 31st, 1862. It would, therefore, appear that there is no very great pressure of patients upon the hospital; at the same time the cases in the house were sufficiently serious.

During the same year, 1,072 patients were treated to a termination, and 50 died, giving a mortality of 4·66 per cent. During the three years immediately preceding, the per-centage mortality was 4·2, 5·1, and 4·3 respectively. On looking to the classified return for the latest of the years above quoted, we find that 142 fever cases were admitted, of which 13, or as nearly as possible 9· per cent., died. It is obvious, therefore, that the admission of fever cases adds considerably to the mortality of the institution.

Among the medical cases received into the hospital we find that, in addition to those just spoken of, there were 57 of acute rheumatism (with four deaths), 99 of bronchitis (with eight deaths), 18 of ascites (with five deaths), 21 of heart disease (with two deaths), 12 of phthisis (with two deaths), four of aneurism (with one death), seven of laryngitis (with two deaths), eight of pneumonia (with one death), and 25 of scarlet fever. Among patients suffering from surgical disorders we notice the following: patients suffering from burns and scalds 11, of whom one died; from injuries of the head 21, of whom five died; from fracture of other bones than those of head 32, of whom one died; from hernia 11, of whom two died; from stricture 22, of whom two died; from calculus seven, from ulcer of leg 69, from paronychia 12, from venereal affections 36, from eye diseases 70; from other affections (including six cases of erysipelas) 24.

The actual number of operations recorded is tolerably large; thus in the two years ending with the close of October 1863 235 operations were performed. But these include a very large number of tappings of hydroceles, of removals of cancerous lips, of circumcisions, of amputations of fingers, of operations on the eye, on the urethra, on clubfoot, and other minor operations. Of operations of the classes selected for comparison we find the following: five for strangulated hernia (with one death); one of lithotomy (in a child); four of amputation of the leg; eight of amputation of the thigh, with one death (two of these latter were in the hospital at the time of our visit, and were doing well); one of amputation of the upper arm. Of the above operations, two only seem to have been rendered necessary by accidental injury; viz., one of the cases of successful amputation of the thigh, and the case of amputation of the arm.

We were informed that pyæmia rarely, if ever, occurs; and that the same may be said with respect to erysipelas and hospital gangrene. Dr. Stokes affirms that, notwithstanding that the fever cases are accommodated in the same building with the other hospital patients, and even on the same floor with some of them, fever has never been known to spread, not even to medical men, to pupils, or to nurses. J. S. B.

DUBLIN. MERCER'S.

MERCER'S HOSPITAL.—This is quite a small hospital, containing 66 beds only, but it is in the centre of the town in a crowded poor district, receives a comparatively large number of accidents, affords clinical instruction, and is therefore an institution of a certain amount of importance. It is an irregularly built building of four floors, including the basement, with wards on the upper three floors. It is closely hemmed in by houses, but has a small piece of ground behind. It contains eight wards, of which one is a small private ward, with two beds, occasionally occupied by paying patients. Of the other seven wards, two are on the ground floor, and are male accident wards; three are on the first floor, a female accident ward, and a male and a female chronic surgical ward; and two are on the top floor, a male and a female medical ward. Of the beds (excluding those in the private ward), 36 are for males, 28 for females, 15 for medical and 49 for surgical cases.

IRISH HOSPITALS.

DUBLIN. MERCER'S.

The wards are quite irregularly arranged, but in proportion to the number of beds they contain are sufficiently lofty and spacious. Some open into a corridor, and have ventilators communicating therewith; but in all cases the actual windows are situated on one side only. There are open fire-places, and the wards are lighted by gas. The bedsteads are chiefly of wood, without curtains, and the mattresses of straw. The hospital is said to be frequently cleansed, and to be whitewashed once a year, yet it certainly did not appear clean at the time of our visit. There are no water-closets or privies; and in all the wards (male and female), except one, the night chair has to be used; in the exceptional case the night-chair is contained in a small adjoining closet, which closet (when we entered it) had in consequence a strong fæcal odour. The only baths are moveable ones. There are four day nurses resident in the house, and a non-resident night nurse. There are two physicians and four surgeons, who take duty periodically, and two resident pupils. Treatment is said to be chiefly stimulating; tow is used in the cleansing of wounds, and both water-dressing and unguents are freely used in their treatment. A certain proportion of patients are admitted by letter, but the great majority of cases are accidents and cases of emergency, and these are received at all hours without letter. Fever and all other infectious cases are rigidly excluded.

During the year 1862, 610 cases were admitted, of which 302 were accidents and emergencies. 28 deaths occurred, so that the per-centage mortality was 4·6. In the year ending March 31st, 1860, 718 persons were admitted, of whom 32 died, yielding a per-centage mortality of 4·4. The annual average of deaths is, we believe, generally pretty nearly the same. But it is important to observe that in the registered number of deaths are included those persons who are brought dead to the hospital (in the year 1862, there were three such cases); again, that notwithstanding the comparatively small number of medical cases admitted, no less than 17 out of the 28 deaths were due to causes which in London hospitals are regarded as medical, such as hydrocephalus, heart disease, tabes, epilepsy, and hæmoptysis, and to certain emergencies (which, though strictly medical also) may by mistake be admitted into surgical beds, such as cases of poisoning, apoplexy, and the like. Of the 11 deaths from surgical causes, five were from burns, one from drowning, one from strangulated hernia which had been operated upon, and four from severe accidents.

Notwithstanding the comparatively large number of cases of accident brought to the hospital, capital operations can scarcely be often called for, or at least can rarely be performed; thus, on looking through the records of the year 1862, we could only discover 12 operations, viz.: three cases of lithotomy in children, one of amputation of the thigh for compound fracture, one of excision of the knee, one of removal of a tumour from the upper jaw, one of excision of the lower jaw for cancer, one for femoral hernia, and two or three minor operations. Of these the only fatal one was the operation for strangulated hernia.

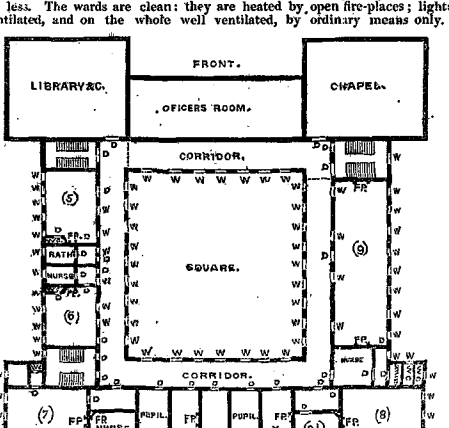
There were at the time of visit 30 patients in the house, 17 male, 13 female, 12 medical and 18 surgical. The medical cases comprised three acute cases, six chronic cases of a serious character, and three trivial cases. The surgical cases included seven cases of accident (viz., five simple fractures, one compound fracture, and a stab), six acute cases (including an excision of the knee, an amputation of the leg, a removal of the breast), all doing well, and a case of vesical calculus. The remaining cases were chronic or trivial.

There was no erysipelas or pyæmia in the house, and we were told that pyæmia, though not unknown, is infrequent. The comparative infrequency of serious operations, and the scanty filling of the wards, may together partly account for this. J. S. B.

DUBLIN. DR. STEEVENS'S

DR. STEEVENS'S HOSPITAL.—This hospital lies somewhat low, not far from the Liffey, to the south-west, and quite at the margin of the town. There are no large buildings near it to interfere with ventilation. It stands on two or three acres of ground. A school of medicine is attached to it. The hospital is one of the largest in Dublin, being considered to have accommodation for 250 beds. At the time of our visit, however, it contained only 223. The plan of the hospital is sufficiently simple; it consists of a quadrangular building of three stories (including ground floor and attic), and of a detached one-floored fever house. The front of the main hospital is occupied by resident officers or used for official purposes, and the remaining three sides are devoted to the special purposes of a hospital. Around the whole of the inner aspect of the building, on both the first and attic floors, runs a continuous spacious corridor, lighted by numerous windows, and communicating freely by doors and windows with the wards which flank it. On the ground floor there is a similar but entirely open corridor. All or nearly all the wards have windows on two sides, and for the most part of sufficient size and in tolerable abundance. But in the majority of cases the windows on one side necessarily communicate indirectly only with the outer atmosphere. The wards at the corner of the building have their windows on two contiguous sides. The wards vary considerably in dimensions, some being large enough to hold 30 beds, others not being suitable for more than five or 10; and three wards contain from one to four beds apiece only. The wards on the ground and first floors are sufficiently lofty, varying between 14½ and 15½ feet high, but those on the attic floor are very low, being little more than seven and a half feet high, and have, moreover, sloping roofs. The fever wards, two in number, are comparatively large and lofty, are ventilated on both sides, contain 10 beds apiece, and allow to each bed a cubic space of about 1,500 feet. The beds throughout the hospital seem generally at a fair distance apart, but in one or two of the wards are too densely packed; in many instances, too, the cubic space allowed to each bed is abundant, ranging from 1,100 to 1,400 feet; but in the attic wards, and in

one or two of the most crowded of the others, the cubic space per bed is considerably less. The wards are clean: they are heated by open fire-places; lighted by gas; ventilated, and on the whole well ventilated, by ordinary means only. The



DR. STEEVENS'S HOSPITAL.—First Floor.

hospital is periodically cleansed and whitewashed, though not generally emptied for the purpose; and the floors are frequently scrubbed. The floor of the accident ward is tiled. The bedsteads are of iron, and the mattresses for the most part of straw, and frequently renewed. There are water-closets on every floor, which are well drained and supplied with water, but the position of some of them in relation to the wards is highly objectionable. There is a bath-room on each floor. The hospital is well supplied with water. As a rule there is a nurse to each large ward, or to two small wards, and to each nurse a ward maid. There are three night nurses. All live on the premises, and are boarded. Three acting phyicians and the same number of acting surgeons have the charge of the patients; besides whom there is a resident (qualified) assistant surgeon, and there are eight resident pupils, two medical and 6 surgical.

The hospital contained at the time of our visit 208 beds, together with 20 in the fever house, making a total of 223. There were 18 wards in use, including in this number three small wards, containing one, three, and four beds respectively. All the wards on the attic floor, four in number, and one of the fever wards, comprising together 74 beds, are assigned to the constabulary. Of the remaining wards, six (containing 88 beds) are assigned to male patients, five (containing 58 beds) to female patients, and two (containing three beds) to males or females according to circumstances. 78 of the hospital beds, including four devoted to the diseases of women, 20 to fever cases, and 20 to the constabulary, are medical, and 142, comprising 13 male venereal, and 44 belonging to the constabulary, are surgical.

At the time of our visit, there were 154 patients in the hospital; viz., 113 males, 41 females, and 61 medical and 93 surgical cases. 54 of this number, 33 medical and 21 surgical, belonged to the police force. The medical cases comprised 15 acute cases, of which six only (including acute rheumatism, small-pox, and pleurisy,) were serious, and 46 chronic cases, of which number 17 (comprising phthisis and other visceral diseases) were grave. Of the 93 surgical cases, 14 were cases of accident, 11 were acute cases, and 68 chronic or trivial. These cases comprised 18 of primary syphilis, four of simple and one of compound fracture of the leg, and two cases of burn. There were also in the hospital a case of excision of the elbow, a case of herniotomy, and one of lithotomy. It is noteworthy that a good many cases placed under the care of the surgeon are essentially medical cases; but this seems a not uncommon circumstance in the Dublin hospitals.

On examining the records of the hospital, it appears that during the year ending March 31st, 1868, 2,395 cases were admitted, and 2,414 were treated to a termination, of which 68 died, giving a mortality of 2·8 per cent. only. The mortality in previous years has also

APPENDIX.

No. 15.
The Hospitals of the United Kingdom. by Dr. Bristowe and Mr. Holmes.

IRISH HOSPITALS.

DUBLIN.
DR. STEEVENS'S.

been low; thus in 1861 it was 2·6 per cent., in 1860, 2·15 per cent., and in 1859, 1·9. How does this low death-rate arise? Undoubtedly the hospital is a well-conducted one, on the whole a well-ventilated one, and a hospital which strikes one as likely to be healthy. But there are so many circumstances which combine to render its mortality low, quite irrespective of any special healthiness in the institution, that to refer this lowness of mortality to the latter cause would be quite unjustifiable. First, the majority of cases treated in the hospital are surgical cases, and wherever this is the case the mortality of an institution is invariably comparatively low; second, the hospital is on the outskirts of the town, and receives a much smaller number of serious accidents than many of the other hospitals of Dublin; third, among the cases habitually received are a large number of cases which rarely prove fatal, such as syphilis and gonorrhœa (232 cases), ulcer of leg (76 cases), chronic rheumatism (166), catarrh (83), dyspepsia (56), and eye diseases and affections of the skin (184). To this it must be added, that a large proportion of the patients, at least one third, belong to the Constabulary; and although at times serious cases (medical and surgical) occur among them, the greater number of the maladies for which they seek assistanceare not of a nature likely to prove fatal. Thus in the last year about 870 policemen were admitted, of whom nine died, yielding a mortality of only 1·02 per cent. Further, it must be remarked, that although there is a fever house attached to the hospital, few cases of fever or of other infectious diseases apply, and the wards constantly contain cases of the same kind as are treated in the other medical wards of the hospital. Lastly, we must draw attention to a fact showing the comparative worthlessness of the published statistics. In one part of the last report it is stated that the number of patients treated to a conclusion was 2,414, of whom 68 died, giving a per-centage of only 2·8; but in another part of the same report it is declared that the number of cases treated to a conclusion was 2,176, of whom 74 died, which (if the correct version) raises the mortality of the hospital to 3·4 per cent.

During 19 months, from May 1862 to November 1863 inclusive, 105 operations were performed at this hospital, but the great majority of these were minor operations, such as removal of cancer of lip, operations on the eyes, amputations of fingers, operations for phymosis, and the like. The only grave operations of the kinds we have selected for comparison were the following:—

Amputation of leg for injury	1	-	1 fatal
Amputation of foot	1	-	0 fatal
Amputation of forearm for injury	1	-	0 fatal
Amputation of forearm for disease	1	-	0 fatal
Excision of knee	2	-	2 fatal (one shock, one pyæmia)
Excision of elbow	2	-	0 fatal
Herniotomy	5	-	1 fatal
Lithotomy	1	-	0 fatal

Operations are said to succeed well. For several years past there have been once or twice a year outbreaks of erysipelas, distinctly traceable to overcrowding, but rarely fatal. Pyæmia seldom occurs. Three cases of hospital gangrene occurred last summer in one ward. The ward was overcrowded at the time, and the outbreak was preceded by the presence in it of two cases of acute inflammation and gangrene after extensive laceration. The health of the officials generally is good, and medical complaints (such as fever) are said not to spread. The average daily number of beds occupied was during 1862, 184; the wards, therefore, must have been rarely overcrowded; and the average time spent by each patient in the hospital was 26 days. All cases are admitted, except female syphilitics belonging to the class of prostitutes. Many of the patients come from the country. No letter of admission is needed.

J. S. B.

SPECIAL HOSPITALS.

FOR SICK CHILDREN, LONDON.

SPECIAL HOSPITALS.

The HOSPITAL FOR SICK CHILDREN, IN GREAT ORMOND STREET, is, in its constitution and regulations, a general hospital, but a special institution in the class of inmates it receives. These are children between the ages of 2 and 12.* No diseases are excluded except small-pox and hooping-cough; the former on account of its great contagiousness; the latter as being more safely treated at home. The patients labouring under exanthematous or other febrile diseases are treated in separate chambers, containing 8 beds, and those in whom there is reason to apprehend the onset of such affections, are placed in a separate room ("quarantine ward") till the nature of the disease has declared itself.† The other patients are placed in two wards; one for girls containing 19 beds, and another for boys containing 25 beds.

The hospital is made out of two large private houses, joined together by a communication through the party-wall on the first floor. Each has a large garden, which gives the children a play-ground. One of the houses, however, contains almost the

* Younger children are taken in for special reasons, though rarely.

† The floor containing these rooms is separated from the rest of the house by a locked door; and the medical officers are directed not to visit the general wards for half an hour after having been in the fever wards, but this rule is found in practice difficult to follow.

whole of the special hospital arrangements, having the out-patient department in an out-building on the ground floor, only connected to the hospital by a doorway into the dispensary; the girls' ward on the first floor, the boys' ward on the second (each of these occupying the whole of the floor), and the quarantine and fever wards on the third, or attic floor. In the second house there is a convalescent, or play-room, on the first floor, and an infant nursery (or crèche, as it is called in France), on the ground-floor.* The rest is occupied by dwelling-rooms for nurses, &c.

The rooms used as wards are large, lofty, and well ventilated (for a private house); they are of irregular shape, as consisting merely of ordinary drawing-rooms and bed-rooms thrown together; and the beds are necessarily arranged in irregular order, and sometimes very close together. This is, however, a matter of less consequence, since it is absolutely impossible to separate children from each other in the same strict manner as may be done with adult patients. The average cubic space per bed is about 750 feet; rather more in the fever than the general wards.

The subordinate regulations, such as those for washing the floors, cleansing the bedding, &c., are the same as those in general use, and do not call for special note. The admission of patients is by letter, and on urgency from among the out-patients. Patients are admitted at all times. The number of out-patients being extremely large, there is a wide field for the selection of cases, and the medical cases are many of them urgent. On the surgical side a great number of chronic cases of disease of the joints (especially the hip) and of the spine are received by letter. The mortality is high, in consequence of the nature of the cases admitted. In 1862 the total number admitted was 543, and the deaths 61, 11·2 per cent. Of these, 47 were due to acute medical affections, six to chronic medical affections, four to acute surgical diseases, three to surgical operations, and one to chronic surgical disease. Pyæmia was noted in two cases. Surgical operations are tolerably numerous. They are performed chiefly for chronic diseases of the joints and bones, and usually do well. Secondary affections are rare; but erysipelas and phagedæna in a mild form have been seen in a few scattered cases occasionally; and the occurrence of two cases of pyæmia in the same year is noted above.† No accurate record of operations has been kept. The hospital is not an unhealthy place of residence, except for the great probability of catching scarlet fever, by medical attendance on cases of that disease in the fever wards. So great is this risk, that hardly any resident medical officer, unprotected by a previous attack, has been known to escape. Only one, however, has died. Scarlet fever and measles do also occasionally spread, either from the fever cases in the attic, or from cases admitted into the general wards, with those diseases latent at the time of admission‡; and those wards have sometimes been emptied in consequence. But on the whole, such visitations are rare, and are still more rarely severe; and when the extension of the hospital premises enables the managers to place cases of exanthematous fevers in a separate building, they will no doubt be in a great measure obviated. There can be no question as to the necessity of separating exanthematous fevers from the general wards in a children's hospital, and more especially when the latter is established, as here, in a private house. But the inexpediency of maintaining a hospital for acute diseases in a private house is fully recognized by the committee in their last annual report, and their efforts are directed to establish proper hospital buildings.

There is no separation of medical and surgical patients. The latter form one-fourth of the whole.

The hospital is usually quite full, except the chambers reserved for fever, the number of cases of which varies from time to time. On the whole, the total average daily number of patients is 46. There are always a large number of less acute cases (especially chronic affections of the organs of locomotion) waiting for admission.

The average duration of all the cases, chronic and acute, is 24 days.

The regular staff of nurses is thus stated:—One sister, six day nurses, three night nurses, and one attendant on the convalescent ward. The whole establishment is under the gratuitous supervision of a lady superintendent, and there are always some pupil nurses who assist the regular staff of nurses.

At the time of visit, there were in the general wards 42 patients, and in the fever wards 8; a total of 50 patients. The eight fever patients were all suffering from scar-

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* This, however, though supported by the hospital, is not an integral part of it, and has been removed since the above was in print. The room so obtained has been used for 10 new beds.

† One of which, however, was in the course of a medical affection.

‡ The number of cases of fever which have broken out in the house in a space of two years 1861–1863, is as follows:—

Scarlet fever	19	7	died.
Measles	12	4	„
Diphtheria	1	—	
Typhoid fever	1	—	
	33	11	died

It must be remembered that some of these patients were admitted with the disease latent.

latina or its immediate consequences. Of the patients in the general wards, 28 were medical, 15 of whom only were labouring under acute affections (less than the ordinary proportion); 14 were surgical, five of whom were classed as acute cases; one burn*; and four of the operations selected for comparison, viz., lithotomy, and resection of the hip, knee, and elbow.

J. S. B. T. H.

SPECIAL HOSPITALS.

CHILDREN'S INFIRMARY, LIVERPOOL.

The CHILDREN'S INFIRMARY, LIVERPOOL, is a small hospital attached to a tolerably large dispensary, and was originally a private residence. It is situated in the town, in a street with other houses, and has a small back yard, in which clothes are dried, but no playground. The wards are on the first and second floors. The arrangements are the same on both floors; on each there are two wards separated by a nurse's room, which has a door of communication with both. The wards are small, and contain four and six beds respectively; the larger ward extends from the back to the front of the house, and has a window at each extremity; the smaller ward has one window only. The ventilation seems to be pretty good, and the wards were quite free from ill-smell when we visited them; they are provided with open fire-places, and have coloured walls. The floors are scrubbed twice a week, and the building itself cleansed thoroughly and emptied, once a year. There is one watercloset which opens out of the landing on the first floor. The children are bathed in portable baths. There are a matron and two nurses; and when necessary extra nurses are hired. The beds are iron cribs, with wooden trays sliding on the top rails for meals and for playthings. The mattrasses are of horse hair, covered with macintosh, and are in three pieces.

All infectious diseases are excluded, and if they break out in the wards, those attacked are sent home. Children between two and twelve only are received, and they must have a subscriber's recommendation. Medical and surgical cases are mixed up together, but girls and boys are, to a great extent, separated.

At the time of visit, there were 20 patients in the building (all the beds being occupied); 15 were surgical cases, all cases of scrofulous diseases of the spine or large joints; and 5 were medical, 4 being cases of paralysis and one a case of phthisis.

During the year 1862, 88 children were admitted, and 5 (or 5·6 per cent.) died. In the list of admissions are included seven called zymotic diseases, eight diseases of the lungs and air-passages, seven diseases of the brain, 10 strumous diseases, and 34 "surgical" diseases.

Of the five deaths, one was the result of scarlet fever caught in the house, two were due to scarlatinal dropsy, one was a case of psoas abscess, and one a case of marasmus.

J. S. B.

DREADNOUGHT HOSPITAL SHIP.

The DREADNOUGHT HOSPITAL SHIP is a 120-gun ship, moored off Greenwich. Her name in the service was the Caledonia, and she took the place of the former ship and the name of the old Dreadnought in 1856. The former ship was a 96-gun ship, and was made to hold 180 to 190 beds. The number of beds in the present ship is 203, not including the hammocks of convalescents.

Three decks are occupied by the patients; the upper being used for surgical, the middle for medical, and the lower for venereal cases.

Any disease or accident occurring to a sailor, and preventing him from doing his duty, is esteemed a title to admission, and landsmen suffering from grave accidents are also received. Small-pox, however, and itch are excluded, as are cases of incurable disease, which are not likely to receive benefit. But all the other exanthemata are received. There are no means of separating cases, reputed to be infectious, from the rest of the patients. Admission is given daily, on week days, between 9 and 3 o'clock, to cases of disease, and at any time to cases of accident.

The wards run from near the stern of the vessel (the after part being reserved for the officers of the ship, museum, &c.) to the bows. They are ventilated partly by the port-holes (which have been made double, and measure 3 ft. by 2 ft.); by ventilators in the sides just below the railings of the wards; by three large shafts, passing through the whole three decks, and into the outer air; and lastly, by similar shafts passing through the decks only. The ventilation is thus very abundant, and there is as much room as seems practicable in a ship. The beds are arranged in double rows on each side of the masts, so as to make four rows of beds in each ward. They are distant about four feet from each other in one measurement, and eight feet in the other. The beds are made of horse-hair, and this is destroyed after a bad case, and is picked to pieces, and cleaned after a certain period of use. The cubic space per bed seems not to have been calculated, but is said to be considerably more than in the former ship, in which it was estimated by Mr. Tudor at about 1,000 feet. Thus it is seen that there are many elements of healthiness in the present hospital, which there were not in the old ship, where the mortality was very high. Nevertheless, secondary diseases are excessively frequent in the ship, and operations are reported to do very badly; but, as

* It should be noted that accidents are not, as a rule, received at this hospital.

no records are kept, we can only give the impressions of the surgeons of the hospital on this head. The following account of the deaths on the surgical side for three years will show the number of fatal cases of hospital affection. In the year 1861 there were 18 deaths on the surgical side; 10 from the direct result of accident, and the remainder from hospital affections, viz., six cases of pyæmia, four after operation, and two after abscess; one case of erysipelas after operation; and one of diffuse cellular inflammation. In 1862 there were 17 deaths: six after injury, two after amputation (the direct cause not stated), two from disease, five from pyæmia, one from erysipelas, and one from diffuse cellular inflammation. In 1860 there were 22 deaths: eight from injury, one from amputation, five from disease, four from pyæmia, one from erysipelas, two from diffuse cellular inflammation, and one from sloughing phagedæna.

It appears clear that when the change of ships was first made there was not this large proportion of deaths from hospital diseases. Mr. Tudor's paper on the subject* is well known, and was written chiefly to show how well surgical operations succeeded at that time, with the precautions as to the dietary, dressing, and management of the patients which Mr. Tudor there describes. At the present time the state of things is changed. We are informed that "amputations do badly, and pyæmia is frequent."

The prevalence of these hospital diseases is attributed by the surgeons now in charge, partly to the situation (for the river is often offensive), partly to the defective ventilation, or rather the deficient space, incidental to a floating hospital; and partly to the timbers of the ship having become saturated with the diseased emanations from the patients, and so furnishing a constant reservoir of poison. That the latter is the most powerful cause, appears probable from the facts, that the space and ventilation were certainly no better when the hospital was in a more healthy condition; and that the offensive exhalations from the river have not been so bad of late as formerly, yet the death-rate in the hospital is steadily rising.† The above remarks refer to comparative conditions of the hospital at different periods, and are intended to suggest precautions, which, though perhaps impossible at the Dreadnought, can easily be observed at more favourably situated hospitals, viz. the great importance of having impervious materials for the walls, and of emptying and thoroughly cleansing the wards from time to time. These questions will be found discussed in their proper place in the body of our Report. Meanwhile, it must not be forgotten that there are permanent causes at work in the Dreadnought, besides those which we may possibly agree to regard as temporary. The whole ship is very draughty in cold or blowing weather, though the temperature is kept up to 60° by hot water-pipes laid round the wards. The water supply seems indifferent, the pipes, as they come through the river, being rather liable to get fouled by ships' anchors, &c., and so to leak; the miasma from the river is continually troublesome.‡ Finally, though there is a large proportion of chronic cases (especially scorbutic ulcers), there is also a good proportion of acute diseases, and many of the patients are broken down by a life of hardship and debauchery.

In a few cases fever seems to have appeared in the ship; thus, between November 1861 and January 1862, three petty officers took typhoid fever and died, and the boatswain's wife and some others were also attacked, but recovered. No spread of fever after admission is complained of.

We have received a classified list of admissions into the medical ward for 11 months of the year 1863, including 713 cases. This, though not a complete list, gives a fair sample of the kind of cases admitted. Out of the above number, 149 were cases of rheumatism and sciatica, 100 were cases of ordinary fever (as to which it is noted that none broke out in hospital), eight of west coast and yellow fever, three of scarlatina, 33 of ague, 21 of pneumonia, and 58 of dysentery. These extracts from the list will show, that although many of the medical cases are chronic, there are a very considerable number of acute diseases, and that the practice at this hospital is very different from that of a rural infirmary.

J. S. B. T. H.

THE HASLAR HOSPITAL, near Portsmouth, receives sailors and marines, and their officers, from the ships of war in the port. It is an old building, dating from the reign of Geo. 2., and used to consist of a general hospital and a lunatic asylum. The latter is now removed, and the building so occupied thrown into the general hospital, which is thus enabled to accommodate 1,200 patients. Previously it was calculated for 950, though 1,000 could be accommodated on emergency. The hospital, however, is never full, (at least in time of peace). We were informed by one of the surgeons who had been here for five years, that he never knew more than about 700 patients at

* Lancet, April 9, 1859.

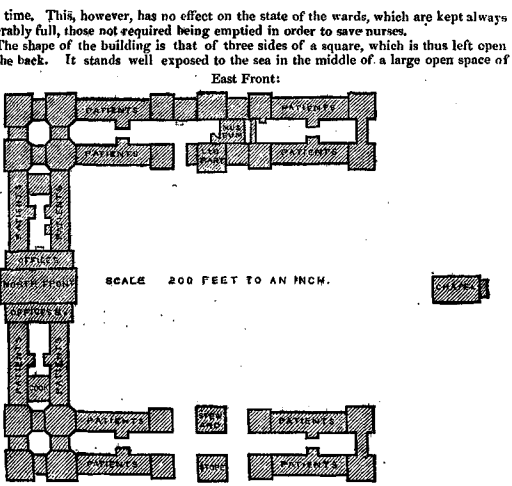
† In the year 1859-60, 1,740 patients were admitted; 77 died; 4·4 per cent.
" 1860-61, 1,780 " 82 " 4·603 "
" 1861-62, 2,227 " 129 " 5·6 "
" 1862-63, 1,909 " 125 " 6·5 " 6·4

‡ The ward nearest the river (syphilitic) is thought to be the least healthy. Hence, when syphilitic cases do badly, they are sent on to the upper deck.

one time. This, however, has no effect on the state of the wards, which are kept always tolerably full, those not required being emptied in order to save nurses.

The shape of the building is that of three sides of a square, which is thus left open at the back. It stands well exposed to the sea in the middle of a large open space of

East Front:



West Front.

NAVAL HOSPITAL, HASLAR, PORTSMOUTH.

ground, about eight acres being attached to the hospital itself. Its construction is rather peculiar. The whole hospital (except a small central part now made into wards, though not generally in use, previously the store department,) consists of a double row of blocks of building, with a space between them. These spaces are closed in the front or central part of the hospital, but the sides are interrupted by a pavilion (used for museum, &c.,) so that the courts separating the double blocks are open. The wards are all on the same pattern. They are rather wide, and have sash windows on both sides, with a single row of beds along each side. A pair of beds are placed between most pairs of windows, each ward containing 14 beds. "Cabins," as they are called, for the nurses, adjoin each ward. They are large, airy rooms, for sleeping and living. Some of the nurses are single women, others married couples. The wards are spacious, airy, and excessively clean. The beds are widely separated, except those placed in pairs which are from two to three feet from each other. The water closets are spacious and perfectly sweet. They project from the main building, and are separated from the wards by double doors, &c.

There are also quarters for officers. The petty officers have large rooms with four beds in each, provided with curtains, (which the general hospital has not). The midshipmen have separate closets or chambers in large wards, the chambers divided from each other by partitions, not reaching the ceiling; the commissioned officers a separate bedroom and sitting room.

The staircases are extremely roomy, spacious, and handsome, and keep the whole building very perfectly ventilated. The wards have, besides the natural ventilation, shafts which communicate with the air, passing above the ceiling of the wards, and are to have also ventilators into the chimneys.

The practice (surgical) at this hospital seems to be very successful. Erysipelas hardly ever appears, except in scattered cases, and is usually, if not always, of constitutional origin; phagedæna is said to be unknown, and pyæmia very rare.

Only one death could be remembered, after amputation, in a space of four years; but then amputations are rare, as the subjoined list will show.

This success is attributed to various causes. The patients are mostly vigorous men, selected for their healthiness. The class of cases are in a great proportion chronic. There is no preponderance in the wards of large acutely suppurating sores.* The

* Medical and surgical cases are separated. In the accident ward, though 14 patients could be received, the medical officers take care not to admit more than 10 cases.

operations are performed chiefly for chronic disease, rarely for injury. The beautiful site and pure air of the hospital must count for something.

STATEMENT of the NUMBER and RESULTS of certain OPERATIONS performed in HASLAR HOSPITAL, during the Years 1860, 1861, and 1862.

Nature of Operation.		Number.	Result.	
			Recovered.	Died.
Amputation of thigh	For Injury	2	1	1
	For Disease	1	1	—
Amputation of leg	For Injury	—	—	—
	For Disease	1	1	—
Amputation of arm	For Injury	—	—	—
	For Disease	3	3	—
Amputation of fore-arm		—	—	—

To these may be added one case of excision of the head of humerus, for gun-shot injury, and three operations for extensive necrosis of the tibia, in each of which nearly the whole shaft of the bone was removed; all did well, and recovered, with useful limbs.

T. H.

ROYAL VICTORIA HOSPITAL, NETLEY.—So much has been said about this hospital, that, although our mission did not extend to military hospitals, we requested leave to visit it. This is the most complete, and the largest example of a corridor hospital, with small and numerous wards, which exists in Great Britain. But in speaking of this hospital, it must not be forgotten that this, like other military hospitals in time of peace, is quite a different institution from the hospitals for acute disease, which are to be found in large cities. A very small proportion of the patients are suffering from acute disease, and a very large proportion are out of bed; that is to say, the place partakes largely of the characters of a convalescent asylum; and for this double purpose of uniting a hospital for a few acute cases, with a temporary convalescent asylum for a larger number, it appears to us not ill adapted; but it would be absurd to reason on its plan of construction, as though it were intended for a hospital like St. Bartholomew's, or the Leeds Infirmary, i.e., for the treatment of all kinds of acute diseases on the one hand, or for the reception of all the accidents of a large manufacturing town on the other. We are speaking here only of the building, considered as a hospital; nothing can be said too warmly in praise of the arrangements for instruction in the special duties of military surgeons which are made here. We have some apprehension, however, in contemplating the possibility of this institution (as might possibly happen in time of war) being called on to discharge the functions of a hospital for acute disease and extensive injury, functions for which hospitals with numerous small wards appear to us very ill-fitted.

J. S. B. T. H.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—This hospital occupies a fine site in the suburb of Brompton. It possesses ample grounds for patients to take exercise in, and is itself a handsome building in the Elizabethian style.

Its general form is that of the letter H; and on each floor it presents a system of corridors, having the same form as the hospital itself, and series of wards arranged on one side only of each corridor. The arrangement of the corridors is somewhat peculiar; the corridor belonging to the central part of the building is situated at the back, but the corridors belonging to the wings (into which the former opens) are placed, the one along the outer side of one wing, the other along the inner side of the opposite wing, so that they both face the east, and thus protect the wards from the direct influence of the winds from that quarter.

Two floors are used for wards, the 1st and 2nd; one being devoted to the reception of males, the other to the reception of females. The wards are small and comfortable, and contain from two to eight beds a piece only; they open, on the one side, into the corridor, and on the opposite side present generally one or more windows. A few wards, those situated at the extremities of the wings, have windows on more sides than one. There are open fire-places in the wards; but the warming of the wards, of the corridors, and indeed generally of the hospital, is made to depend chiefly on a system of artificial ventilation and heating. The plans adopted on the two sides of the house are different, but the principle of both plans is essentially the same. Air is attracted from without to special forms of warming apparatus, situated in

SPECIAL HOSPITALS.

HOSPITAL FOR CONSUMPTION, BROMPTON.

the basement, and is thence diffused by proper channels to all parts of the house finding an entrance into the wards and into the corridors through openings (which allow of being regulated) in the wall, a little above the floor. The vitiated air is withdrawn through other orifices, which communicate ultimately with a shaft which is carried upwards in one of the ornamental towers of the building. The interior of the shaft is heated by similar means to those adopted in the basement for heating the air of the house; and we may add, that the whole apparatus is found to work efficiently. There is no doubt that the corridors are, by this artificial means, kept, even in the depth of winter, at an agreeable temperature, and are hence made available, with perfect safety, as places of resort for patients, in which they sit and lounge, walk, and even take their meals. This artificial system of warming has been in use ever since the opening of the hospital, and seems to have been universally approved of by the medical officers of the institution, and hence may reasonably be assumed to have answered a good purpose. To those who are not accustomed to the building, its atmosphere, in cold weather, may seem a little oppressive; and one cannot but suspect that its atmosphere is one which, in a surgical hospital, and in one receiving infectious cases, would lead to serious consequences. But there can be no doubt that patients suffering under chronic visceral diseases do not need those same conditions of hygiene which are so essential in the treatment of the classes of cases just mentioned. There is no reason to dread either the development of hospital diseases, or any specific influence of an injurious character arising from the accumulation of patients of this kind. Indeed, it is extremely probable that consumptive patients especially are more likely to be benefited by an equable temperature than they are likely to be injured by the deficiency of perfectly pure air.

The general management and arrangement of the hospital are excellent. Patients are admitted almost exclusively by governors' letters.

Considering that the hospital is intended specially for the treatment of consumptive patients, it is not surprising that its annual mortality should be heavy. Indeed, it would probably be still heavier than it is, were it not regarded by the governors as an institution rather for the reception of patients in early stages of the disease, than for those patients whose cases are far advanced.

The annual number of admissions for 1856 and 1863 inclusive, has varied between 551 and 936, but has during two years only been below 800. The annual mortality per cent. during the same time has ranged from 13·26 to 19·23. J. S. B.

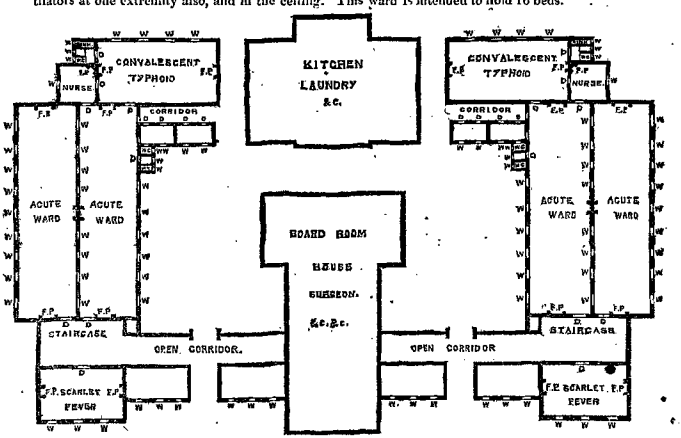
LONDON FEVER HOSPITAL.

LONDON FEVER HOSPITAL.—This institution is situated in the Liverpool Road, Islington, in a street with continuous rows of houses. But the part of London in which it stands is elevated, and reputed healthy; and, moreover, the hospital occupies altogether about three acres of ground, of which the larger part forms a kitchen-garden in the rear. To this the patients have access.

The form of the hospital is symmetrical. It consists of three blocks; of which the central one is devoted to the board-room, officers' rooms, and the like; and of which the two lateral ones are for the reception of patients, male and female respectively. Each lateral block is connected with the central building by a partly-open corridor, which is continued into the block, communicates with the staircase, and separates the anterior part of the block, in which scarlet fever patients are accommodated, from the posterior part, which is for the reception of other infectious diseases. The anterior part consists of two wards, one on each floor; the lower ward for persons suffering from scarlet fever, the upper for those who are convalescent from the disease. These wards are lofty, and comparatively spacious, and contain eight beds a-piece, which are widely separated from one another. They have each three windows on one side, and two ventilators, either in the wall or ceiling; the ward on the ground-floor has also ventilators, which communicate with the corridor. The top of the windows is in both cases far removed from the ceiling, and the windows in the upper room are small. Behind the corridor, on the ground-floor, and opening out of it, are two "acute" wards for the reception of typhus, typhoid, and any other acute case that may be admitted. These wards are parallel to one another, and separated in their whole length by a party wall. They are long, broad, and very lofty. They have each of them nine large arched windows, reaching nearly to the ceiling, in the outer wall; and there are corresponding arches in the party wall, admitting of a free interchange of air between the two wards. Besides, there are in the outer wall of each ward, above and below each window, ventilators which communicate directly with the external air; there are also ventilators in the ceiling, which carry off impure air. The ventilators in the ceiling of the inner of the two wards are four to five trap doors, which open into a loft over the ward, communicating at each end of the building by means of louvres with the outer air; the ventilators in the ceiling of the outer of the two wards, are numerous perforated transverse beams, which communicate with a shaft passing vertically through the ward, which in this instance is situated above. To aid still further in ventilation, there are on both sides of each ward, a little above the floor, and below the windows, perforated zinc plates, which communicate by means of pipes with a

shaft outside the building, in which there is a fan worked by a steam engine. The fan works every other day for a greater or less time; and generally at the commencement of operation, for a couple of hours, is made to withdraw air from the wards; but after this its action is reversed, and air is forced in. There is no artificial means of warming employed, the wards being heated solely by open fire-places; and it must be observed, that in the ventilation of the wards the artificial ventilation does not replace natural ventilation; it is simply additional. The beds are 17 in number in each of the acute wards, and are placed along each side, one between every two windows, so that almost all the different kinds of ventilation intervene between the adjoining beds, which are placed about two yards apart. There is a ward kitchen connected with each pair of acute wards, and a water closet, which is clean, free from ill smells, and well drained. The latter is separated from the ward by a lobby, in which is a kind of trapped pan, for the emptying of the pans and chamber utensils employed in the wards.

Leading out of the posterior extremity of the inner of the two acute wards, is a third ward, placed at right angles, which is used for all convalescents from the acute wards, who have not laboured under typhus. This is a large, lofty, airy room, with four windows on one side, and four ventilators in the upper part of the opposite wall, and four other ventilators just above the floor, which open directly into the outer air. There are ventilators at one extremity also, and in the ceiling. This ward is intended to hold 16 beds.



Front.

LONDON FEVER HOSPITAL.—Ground Floor.

In front of that portion of this ward which projects beyond the two acute wards, and separated from it by a corridor, are two small low rooms, which are used as separation wards for noisy patients; they hold two beds apiece, and, like the acute wards, are ventilated partly naturally and partly by aid of the fan. The only remaining ward on each side is the ward for convalescents from typhus. This is a large room placed over the outer of the two acute wards, and corresponding to it, therefore, in its general form and size. It is designed to hold 21 beds.

It may be added that the central building, the corridors, the lateral blocks, and the wards prolonged from these behind, form together an incomplete oblong; and that the figure is filled in behind by a separate building, which contains the laundry. It will be observed, too, that the part of the building used as a hospital has in no part more than two floors, and in some parts consists of ground floor only.

The water closets connected with the other (than the acute) wards are all well situated in reference to salubrity, and are well drained. There is one bath-room on each side of the house, where all patients, but those who are too ill to bear it, are bathed on admission.

The hospital was extremely clean when we visited it; the ventilation appeared to us to be admirable; and the cubic space is large, being, it is said, at the rate of no less than 2,000 cubic feet to each patient. The wards are scrubbed partly every day, and the

hospital itself cleansed and whitewashed once in two years. The beds in the acute wards are of feather, and in the convalescent wards of flock. After every case the beds are emptied, their contents subjected to heat, and their ties washed.

The number of nurses employed varies according to the number of patients. At the time of visit there were 77 patients, and there were two head nurses (one for each side), and 10 assistant nurses.

Patients are admitted for the most part by parish orders, or by governors' letters; a few gain admission on personal application. Parish patients are required to have paid for them 1*s.* a day. Any fit patient may be admitted on payment of a fee of 2*l.* 2*s.* The majority of the patients actually admitted are paupers, and they are generally sent by the parish authorities in a private cab, or some other special vehicle. All fevers are admitted except small-pox. Whooping-cough would be declined.

The hospital contains 182 beds, equally divided between males and females. There are 16 beds (in two wards) for the reception of patients suffering from scarlet fever; and 16 beds (also in two wards) to which the convalescents from this disease are removed. There are 68 beds (in four wards) for typhus, typhoid, and such acute diseases as may be mistaken for them. There are then 42 beds (in two wards) for those who are convalescent from typhus, and 32 beds (also in two wards) for the convalescents from other diseases. There are, lastly, eight beds, in four separation or noisy wards.

At the time of visit the house contained 77 patients, of whom 33 were males, 44 females; and of whom 16 were suffering from scarlet fever, 38 from typhus, 11 from typhoid, one from erysipelas, and one from dyspepsia. There were nine patients only in the convalescent wards, and none in the noisy wards.

The patients admitted into this hospital vary very considerably, both as to number and as to the nature of the diseases from which they are suffering; and from the fact that the majority of cases admitted are suffering from acute and dangerous diseases, the mortality is usually very high.

The following is the list of cases admitted, and of the mortality and death-rates for several years past:—

	1862.			1861.			1860.			1858.			1856.		
	No. treated to a Termination.	Died.	Mortality per cent.	No. treated to a Termination.	Died.	Mortality per cent.	No. treated to a Termination.	Died.	Mortality per cent.	No. treated to a Termination.	Died.	Mortality per cent.	No. treated to a Termination.	Died.	Mortality per cent.
Typhus	1,778	365	20·8	68	15	22·0	25	10	40·0	17	9	52·9	1,056	204	19·3
Typhoid	221	30	13·5	156	33	21·15	92	27	26·7	204	28	13·72	172	24	13·9
Febricula	102	—	—	41	—	—	31	—	—	47	—	—	101	—	—
Scarlet Fever	188	24	12·76	131	20	15·26	109	12	11·0	116	22	19·0	179	14	7·8
Measles	10	—	—	3	—	—	—	—	—	—	—	—	—	—	—
Other Acute Diseases	357	53	14·8	176	49	28·0	150	29	19·3	194	47	23·33	280	47	16·7
Total	2,656	472	17·77	599	117	19·5	407	78	18·16	578	106	18·3	1,788	289	16·1

It will be perceived from this list, that the admissions of typhoid fever and of scarlet fever have varied within comparatively narrow limits; that the admissions of typhus have varied remarkably, viz., from 1,778 in 1862, and 1,056 in 1856, down to 25 and 17 only in 1860 and 1859 respectively; and further, that there is generally a considerable admission during the year of cases which have been sent to the hospital as fever cases, but are cases really of a wholly different nature. It will be observed, too, that the general mortality of the institution has always been very high, varying between 16·1 per cent. in 1856, and 19·5 in 1861. But this general rate is the sum of a number of rates for the different diseases admitted; and these rates differ greatly from one another, and so also do the rates for the same disease in different years. Thus, the death rate of typhus was, respectively, for each of the five years quoted, 20·8, 22·, 40·, 52·9, and 19·3; of typhoid, 13·5, 21·15, 26·7, 13·72, and 13·9; of scarlet fever, 12·76, 15·26, 11·, 19·, and 7·8; and of other acute diseases (collectively), 14·8, 28·, 19·3, 23·33, and 16·7. The fluctuations in the death-rate of typhus and typhoid are very considerable, but probably not difficult to explain. It would seem that when the admissions of either disease are very few, the mortality per cent. becomes high, and that when the admissions are numerous the mortality per cent. falls; and it is doubtless a fact, that at times, when these diseases do not generally prevail, and there is no public alarm, the few cases which are sent to the hospital are sent in consequence of their being specially severe, and that at times, when an epidemic prevails, the admissions become diluted

(so to speak) with a larger proportion of mild cases. The very heavy mortality which always occurs among other than fever cases which are admitted, is clearly due to the fact that only very severe and dangerous cases can be mistaken for cases of fever; and that hence these "other" diseases comprise cases selected, as it were, for their extreme danger.

As regards the spread of contagious diseases through the house, the following is the experience of the hospital for the five years already referred to :—

1862. The resident medical officer, and a gentleman who acted temporarily for him, both caught typhus, as also did 28 out of 69 nurses. 10 patients, of whom four were admitted with scarlet fever, four with typhoid fever, and two with fabricula, took typhus in the hospital; one nurse contracted typhoid fever, and a nurse and patient caught scarlet fever. Of the 43 persons who caught fever in the hospital, 34 recovered, and nine (all nurses) died.

1861. Only three cases of fever originated in the house, and all recovered. A patient who was admitted with febricula contracted typhus; and a patient admitted with typhoid contracted scarlet fever.

1860. One patient with scarlet fever contracted variola; and a case of typhoid contracted scarlet fever.

1858. No statement.

1856. A housemaid was seized with typhus, but recovered; three nurses also took typhus and recovered; and another nurse had a mild attack of scarlet fever.

In conclusion, we cannot forbear remarking, that the construction and arrangements of this hospital seem to us exceedingly good, that the arrangement of the beds (in the acute wards especially) is excellent, and that the ventilation is as nearly as possible perfect. It seems to us too that the plan on which the convalescent wards are conducted, in virtue of which convalescents are removed from the infected atmosphere of the acute wards, and "sorted" so as to guard them as much as possible from all risk of contagion, is worthy of special notice. We may add also that the records of the hospital are kept on a plan and with a degree of detail that render them unusually instructive and interesting.

J. S. B.

BELFAST HOSPITAL FOR CONTAGIOUS AND ACUTE MEDICAL DISEASES.

BELFAST HOSPITAL FOR CONTAGIOUS AND ACUTE MEDICAL DISEASES.—This hospital belongs to the union, and is specially destined to receive infectious cases of whatever form, and all other acute medical cases. It is considered the finest hospital of the kind in Ireland. The building is a handsome one, and occupies a healthy open site in the suburbs of Belfast. It consists of three floors, all containing wards, and is built in the form of a capital I, with a corridor running along the central line from end to end. The wards and nurses rooms are situated uniformly along each side of the corridor, and those at the two extremities stand out before and behind at right angles with the rest of the building. The corridors are large and well ventilated. The wards are of considerable size and lofty, very clean, heated by open fireplaces, and well ventilated. The beds, however, are very close to one another, and are not only arranged along the opposite sides of the wards, but there is a third row placed lengthwise down the middle. The bedsteads are of iron, without curtains. The water-closets are well situated on each floor, and are approached from the central corridor by a long passage, terminating in a lobby which is entirely open to the outer air. There is a bath room outside the hospital, in which fresh comers are bathed, but there are other baths on the premises for the use of patients in the hospital. There is a staff of paid nurses resident in the house, and they are assisted by women from the workhouse. The patients are under the medical care of a resident medical officer, one visiting physician, and one surgeon.

The hospital contains 23 wards, besides a small room into which babes belonging to mothers with infectious diseases are placed temporarily. The wards contained, at the time of our visit, 445 beds, of which the great majority were occupied by patients. 150 of the beds were for the reception of male patients, and 295 for the reception of females and children. 224 beds were devoted to contagious diseases, such as fevers of various kinds, small-pox, scarlet fever, measles, and whooping-cough, and the rest were assigned to acute non-contagious disorders, of which a considerable number appeared to be dysentery. The different kinds of infectious diseases appeared to be as much as possible separated from one another in special wards. A very large proportion of the fever cases in the house were true typhus.

The number of cases admitted per annum, and the proportion of infectious cases, necessarily vary very considerably. Thus, in the year ending September 1862, 2,574 cases were admitted, of which 980 were considered to be contagious. The deaths in that year amounted to 304, or 11·4 per cent; 41 of the deaths were due to fever, and three to scarlatina.

In the following year, 3,427 cases were received into the hospital, of which 371 or 10·8 per cent. died. The fatal cases included 83 of fever, seven of small-pox, and seven of scarlet fever. Of the 3,427 cases, 1,295 were registered as contagious.

J. S. B.

CORK STREET FEVER HOSPITAL, DUBLIN.—The Cork Street Fever Hospital is a large establishment, standing within the City of Dublin, on several acres of land, and having, therefore, though a town hospital, plenty of external ventilation.

It consists of four detached buildings. One, the central one, contains the administration only. Two buildings, almost identical in external form, are symmetrically placed one on either side of this. One of them is for convalescent cases. It has four floors, of which the upper two are used for wards. The wards are two on each floor, and are separated from one another by the staircase, landing, a nurse's room, and the waterclosets. They are of moderate dimensions, nearly square, have windows on three sides, and open fire-places. They hold 15 beds each. The fellow-building is used for acute cases, but only under extreme pressure, the arrangements of the interior being confessedly on a very defective plan. It consists on each floor, used for hospital purposes, of a series of small rooms for one or two patients each, and of a passage or corridor, by which the wards are approached. The fourth building is in the rear of this last, and is the part of the hospital is common use for the reception of fever cases. Its plan is very much the same as that of the convalescent block. It is an oblong building of four floors, of which the three upper are used for hospital purposes. The centre of the building is occupied by the staircase and by the nurses' rooms, and opening out of this central part, on each floor, are two wards, one on either side. These wards are long, tolerably high and broad, have each five windows on either side, and two at the end, and a couple of open fire-places. They are whitewashed, and perfectly clean, though rather bare and cheerless-looking. The proper number of beds in each ward is 18; but extra beds are not unfrequently placed in them. The beds are without curtains, and certainly too close to one another. The wards seemed fairly ventilated. A vehicle is kept on the premises, which is used for the conveyance to the hospital of fever cases.

The hospital is intended for the reception of the fever cases occurring amongst the poor of the city of Dublin, in the same way that the fever wards of the Meath Hospital are specially intended for fever patients from the County Meath.

The two buildings generally in use contain about 150 beds. During the year ending April 1st, 1862, the average daily number of beds occupied was 89⅝, and the average stay of patients in the hospital was 18¼ days. During the same year 1,700 patients were admitted, and 95 (or 5·5 per cent.) died. In the previous year 1,478 were admitted, and 78 (or 5·2 per cent.) died. The average mortality, from 1817 to 1861, was (according to Dr. Murchison) only 3·96 per cent.; and in no year since 1817 has the annual mortality exceeded 10 per cent.

The mortality seems, for a fever hospital, to be unusually low; but an examination of the table of diseases admitted for any year (we will take 1861-62) shows that the hospital receives many cases that are not fever, and that evidently those which are classified as fever, are for the most part merely trivial cases presenting mild febrile symptoms. Thus, from the subjoined table, it will be seen that 191 cases were returned as cases of typhus and typhoid, and that their mortality was little more than 10 per cent.; but that 752 other cases were returned as cases of common continued fever, and that the mortality among them was less than ·8 per cent.(!).

The pressure on the hospital, the severity of cases admitted, and the mortality all differ necessarily with different years. During the last famine-epidemic of fever, the applicants were so numerous that sheds had to be erected in the grounds of the hospital for their reception.

CLASSIFIED RETURN of the DISEASES of PATIENTS admitted into the CORK-STREET FEVER HOSPITAL, in the Year ended 31st March 1862, and of the Number that died of each particular Disease.

Disease.	No. admitted.	No. Died.	Disease.	No. admitted.	No. Died.
Aneurism of Aorta	1	1	Fever, Hepatic	4	1
Arachnitis	2	2	Hepato-Scirrhus	1	1
Bronchitis	495	25	Icterus	4	–
Burns	1	–	Inflammation, Diffuse	1	1
Carditis	5	1	Laryngitis	1	–
Cynanche Tonsillaris	18	–	Otitis	1	–
„ Trachealis	5	–	Pericarditis	1	–
Delirium Tremens	23	–	Peritonitis	1	1
Diabetes	1	–	Pertussis	1	–
Diarrhœa	26	1	Phlebitis	1	1
Dropsy, Acute	1	1	Phrenitis	1	1
Dysentery, Acute	3	–	Phthisis Pulmonalis	21	4
Endo-carditis	6	1	Pleuritis	13	1
Epilepsy	2	1	Pneumonia	20	2
Erysipelas	7	–	„ Typhoid	14	4
Fever, Typhoid and Typhus	191	20	Purpura	1	–
„ Common, continued	752	6	Rubeola	10	–
„ Intermittent	2	–	Scarlatina	45	13
Puerperal	4	4	Tabes	1	1
Rheumatic	34	–	Variola	4	–
Gastric	1	1	Total	1,666	95

J. S. B.

NEWCASTLE FEVER HOSPITAL.—This hospital occupies a lofty site, commanding a good view, and stands in tolerably extensive grounds.

It is little more than a private house, consisting of three floors, of which the 1st and 2nd are devoted to patients.

On the 1st floor are three wards for fever cases, of which two (one a male and one a female ward) contain six beds each, and the 3rd contains three beds, which are used for males or females.

On the 2nd floor there are four wards used for scarlet fever and small-pox. Two of these are like the two larger wards below, are placed directly over them, and contain six beds each, and two are like the single smaller ward, and contain from four to five beds each. Two are for males, and two for females. The wards are small, are lighted by a single window, have ventilators in the floor, and (in the case of the upper story) ventilators in the ceiling likewise. They have each an open fire-place; and no artificial mode of heating or ventilating. The floors are scrubbed, and the hospital itself is whitewashed and cleansed once in two or three years. The bedsteads are of iron, without curtains; the mattrasses of straw, and often destroyed after bad cases; convalescent patients have flock beds. There is a watercloset on each floor, separated from the wards by a passage; and a bath room on the 1st floor only. There are six medical officers who take charge of the hospital for 12 months each in rotation; and the apothecary to the dispensary (which is far removed from the hospital) has to give daily attendance. The resident officers are a matron, an inspector, and a nurse (occasionally an extra nurse is employed).

The medical officers alone determine on the propriety of admitting patients; but persons who are *not* objects of charity may be admitted on payment of 2*s.* a day. The average stay of patients in the hospital is (roughly speaking) about a month. There is no diet table, the patients' food being regulated by the orders of the attending medical officer. The patients have, when convalescent, free access to the garden in front. A private conveyance is kept.

The hospital contains from 35 to 37 beds, of which three are (according to circumstances) male or female, and the others are equally divided between the sexes. The cubic space allowed to each patient is evidently small.

At the time of visit there were only nine patients in the house, five males and four females. There was one case of typhus, one of typhoid, two cases of variola, and five of convalescence from fever.

In the year ending April 30, 1861, 42 patients were admitted (30 men, 12 women); of these 23 were paupers, 14 sailors, four were servants, and one was a nurse in the hospital, who caught fever in the course of her duties. Six of the cases were of mild small-pox, one was a case of mild scarlet fever, and one of mild measles. The rest were fever cases, and of them two died. Infectious cases prevailed but slightly in Newcastle during that year.

In the 10 years from 1848 to 1857, 1,481 cases were admitted, of which 171 (or 11·54 per cent.) were fatal.

The special fever hospital does not seem to be very greatly needed in Newcastle, as the following remarks quoted from the annual report of Dr. Robinson to the governors for the year 1860-61 shew:—

"It may, indeed, hereafter possibly be a question for the consideration of yourselves "and others interested in the charities of Newcastle, whether a greater amount of "service would not be rendered to the community by transferring to the infirmary the "few cases of fever necessarily existing among our poorer population, and relieving "the institution of the present lock wards, which are, I understand, quite insufficient "for the wants of this district. The conversion of the present fever hospital into a "lock hospital for the reception of unfortunate women labouring under disease, and "its connection with the penitentiary and other reformatory institutions, would, I "believe, prevent a large amount of disease in this and the neighbouring towns, "and materially assist some of those benevolent and religious efforts which "recognise the claims on Christian charity, even of the most fallen and abandoned "of our fellow creatures."

J. S. B.

THE SMALL-POX HOSPITAL occupies an admirable site on Highgate Hill. It stands on extensive grounds, commands a fine view, and is exposed freely on all sides.

It consists chiefly of an oblong block, with a central staircase, from either side of which, on both the ground and first floors, a transverse corridor extends to the corresponding extremity of the building. The wards are confined to the first and second floors. On the first floor there are two acute wards. They lie in front of the corridor, and are situated one on either side of a nurse's room, which occupies the centre. These wards are 68 feet long, 28 wide, and 17 high, and contain 14 beds each. They are provided with open fire places, several doors, and numerous windows on both sides.

The windows opening in the front of the hospital are large, but those on the opposite side are limited to the upper part of the wall above the corridor, the height of which is only half that of the ward itself. Above each window there is a long narrow horizontal orifice, communicating directly with the external air. These wards are in cold weather heated and ventilated artificially, as well as by natural means. Air warmed by passing over plates heated by hot water is admitted into each ward through two gratings; and foul air is extracted through two orifices in the upper part of the wall. These orifices are in communication with a shaft, the interior of which is kept at an elevated temperature by the presence in it of a cistern, constantly supplied with hot water from a boiler in the basement. These wards are clean, well ventilated, and cheerful; and it is stated that the artificial mode of warming, not only never leads to ill consequences, but that it is found to be of the greatest utility. It must be remembered, however, that the windows, even in cold weather, are constantly more or less open, and that the open fire-places are kept in use.

There are, besides the acute wards, which receive patients actually suffering from small-pox, eight convalescent wards, into which the patients are, as soon as possible, draughted. These wards are placed symmetrically at the two extremities of the hospital. Thus, one is placed at the extremity of each acute ward in front of the corridor, and one occupies a corresponding position in the rear of the corridor. The remaining four are placed over these on a second floor, and correspond to them almost exactly. These wards are less lofty than the acute wards, have windows in some instances on two, in some instances, on three sides, and have open fire-places, but have no share in the artificial warming and ventilation. They contain seven or eight beds apiece. The waterclosets and sculleries, and several small wards for the reception of one or two noisy cases, are placed at intervals along the back of the first floor corridor, between the back convalescent wards and the central staircase, and leave spaces in which the corridors obtain free communication with the outer atmosphere by means of windows. The corridors are low, but light and airy, and like the acute wards are artificially heated.

In the rear of the building which has been just described, a smaller building has been erected, which on the first floor contains, besides waterclosets and other necessary arrangements, two wards of moderate dimensions and well ventilated, which are intended for the reception of cases rendered offensive or dangerous by the occurrence of erysipelas or gangrene. These wards are approached by a covered passage from the central staircase of the hospital-proper.

The hospital appeared to us to be kept particularly clean and sweet, and its water closet and other arrangements are all excellent.

The number of beds which can be made up amounts to 100, but the number occupied varies very greatly; sometimes the hospital for a long period is nearly empty, and occasionally, as during the last year, the beds are insufficient to accommodate all the applicants for admission. The hospital is used exclusively for the reception of small-pox patients, who are received, as a rule, on the payment of a fixed sum, that is to say, either by means of a governor's letter, for which the governor's subscription pays, or by the immediate payment of an equivalent sum. The cases are, in large proportion, received from the workhouses and general hospitals of London.

The number of nurses varies with the number of patients.

The bedsteads in use are of iron, and a few only have curtains. Feather-beds and hair mattrasses are employed, but they are protected by a kind of macintosh, and are only occasionally cleansed.

It is an interesting circumstance that, notwithstanding the extreme contagiousness of small-pox,—notwithstanding that persons have occasionally contracted the disease from merely standing at the door of the hospital, the resident officer, Mr. Marson, has never known during a connexion of 28 years with the institution, any nurse or servant of the establishment to be attacked with it. He attributes this immunity to the fact that he invariably vaccinates every one who for the first time enters the service of the hospital.

The statistics of the small-pox hospital, from the year 1836 to the year 1857 inclusive, have been published at length by Mr. Marson, in the 36th volume of the Medico-Chirurgical Transactions, and have been reproduced (with slight additions) by Mr. Simon, in his report on the History and Practice of Vaccination, printed in 1857. It appears that during that time the total mortality per cent. was 19·97.

We may add that epidemics of erysipelas occasionally break out in this hospital, as they do among surgical cases, and with like results; but that such occurrences are on the whole rare, and rarer at the present excellent hospital than they were at the old hospital, which was very defective in its arrangements, and was abandoned some 10 or 12 years ago. Beyond the fact that erysipelas has been less common than it was, there is no evidence whatever to show that patients have done better in the new than they formerly did in the old hospital, which, besides being of radically bad construction, was situated in the crowded locality of King's Cross.

J. S. B.

THE YORK ROAD LYING-IN HOSPITAL is one of the most considerable and important of the lying-in charities of London. But it is more important from its out-door midwifery practice than from the practice which takes place within its walls.

It is a building of two floors, besides basement and attic, and has the form of the letter L. The internal arrangement of the different parts of the hospital is somewhat irregular. It presents numerous corridors and staircases, and rooms of different sizes for various purposes. The wards are seven in number. Of these, two are small labour wards, with a single bed and a bath in each; and in these wards the actual process of labour is always conducted. The remaining five wards are alike in their dimensions, contain six beds each, and are for the reception indiscriminately of patients after and before delivery. The five general wards are placed at the extremities, and at the angle of the building, two on the ground floor and three on the first floor; and on each floor there is one labour ward. All the wards are tolerably lofty; the larger ones have for the most part three windows each, generally on one side; the smaller ones have a single window. The windows open by sashes in the usual way. There is an open fire-place in each ward. In addition to the ventilation and regulation of temperature by windows and fire-places, there is an artificial system of warming and ventilation in use, which consists briefly in admitting the external air into the wards and corridors after it has been previously warmed by passing over hot-water pipes. This system is said to answer well. The bedsteads are of iron; the mattresses are of cocoa-nut fibre, and after each case are "baked" in an oven. They are emptied less frequently than once a year. There is a water-closet on each floor, which is well drained. The wards seemed a little close at the time of visit (the windows being closed), and scarcely so clean as they are generally found to be in English hospitals. Residing in the house are a matron, a midwife, and generally one or two students. The patients received into the hospital are poor married women, or single women of good character in their first confinement. They are admitted by governors' letters, as near the time of labour as possible, but they are allowed to remain in the house for three weeks after the delivery.

The beds in the hospital are (exclusive of the two in the labour rooms) 30 in number, and are all devoted to the reception of puerperal women, no special female diseases being admitted into the institution. The number of patients in the house at the same time is generally small. At the time of our visit there were not more than 10 or 12.

The records of this hospital, like those of many hospitals we have visited, are very imperfect. If the records are correct, numerically, it would appear that the number of deliveries effected in hospital in the years 1858, 1859, 1860, 1861, 1862, and 1863 were respectively 224, 211, 196, 213, 159, and 211. The results of cases, however, are very rarely filled in, and in this respect the records are quite untrustworthy. It seems, however, that epidemics of puerperal fever have been by no means uncommon. Up to the year 1842, we believe that they had been frequent and grave; and their origin during that period was, we believe, traced in a great measure to serious defects of drainage. These defects were remedied. But still occasional outbreaks occurred, and several systems of artificial ventilation, Reid's, Arnott's, &c., were tried, and condemned. The last outbreak was in the autumn of 1861; scarlet fever was introduced into the hospital, and several of the patients died within a short time. The hospital was emptied on the 21st of November, and was not re-opened until March of the following year.

The exact mortality per-cent. of the patients admitted into the house, and the exact details of the various outbreaks of puerperal fever, do not seem to have been preserved.

We have been favoured by Dr. Barnes, since the above paragraphs were written, by the following statement (in the late Dr. Rigby's handwriting,) which supplies important information with regard to the mortality in the hospital during the 24 years ending with 1856:—

1833	180	6		1845	185	1§	
1834	209	6		1846	210	—	
1835	185	12		1847	217	2	
1836	213	7		1848	320	1	
1837	196	4		1849	250	2	
1838	71	19		1850	218	—‖	
1839	171	6		1851	191	5	
1840	210	15		1852	222	2	
1841	117	15*		1853	236	7	
1842	153	11†		1854	252	8	
1843	191	2‡		1855	293	12¶	
1844	165	—		1856	305	3	

* Hospital closed in August. Alteration for establishing Reid's ventilation commenced.
† Opened in April; but ventilation not worked.
‡ These deaths occurred in February and March. Ventilation first properly worked in April.
§ Case of rupture of uterus.
‖ Ventilation discontinued in April 1850.
¶ Ventilation renewed in May. 10 deaths from puerperal fever.

SPECIAL HOSPITALS.

LYING-IN HOSPITAL, GLASGOW.

The hospital is situated in the midst of a very densely populated neighbourhood, and is surrounded on all sides by houses. The building itself seems well adapted for the purposes to which it is applied, and is evidently rarely if ever over-crowded.

J. S. B.

GLASGOW LYING-IN HOSPITAL.—This hospital lies in a poor part of the town, in the middle of a district likely to be benefited by it. It is, however, on the top of a hill, with a small back garden on the slope of the hill, and is, therefore, very airily situated. The hospital itself is a small house, with two floors, and is, in fact, an ordinary dwelling-house in its construction. Besids domestic offices, it contains 10 wards, and 24 beds. Three of the wards are delivery wards, into which patients are admitted, and where they are delivered. These are at the back of the house, two on the first floor and one on the ground floor. They contain nine beds each. Three of the wards are recovery wards, into which patients are removed two or three days after delivery. Two are on the first floor, one with five, the other with two beds; and one is on the ground floor, containing three beds. There is one operating room, with two beds (on the first floor), in which cases for operation connected with the uterine organs are admitted; and there are three private wards, with one bed each.

The house is clean, not crowded (11 patients at time of visit), and fairly ventilated. Each window is provided with one pane of perforated zinc. The water-closet and bath arrangements are unobjectionable.

The domestic arrangements are good.

Patients are received into the house two or three days before confinement, and are kept ordinarily for about 10 days after confinement, often, of course, longer. A few operation cases only are admitted.

In the year 1860–61, 326 women were confined in the hospital, of whom 3 (or ·92 per cent.) died; and 353 were attended at their own homes, of whom 6 (or 1·7 per cent.) died. The deaths of those who died in the hospital are ascribed to cerebral effusion, peritonitis, and typhoid fever respectively. Of the 6 women who died out of the hospital, 2 died from puerperal fever, 2 from exhaustion after post-partum hæmorrhage, one from pneumonia, and one from exhaustion, consequent on difficult and protracted parturition.

In the year 1861–62, 379 women were confined in the hospital, of whom 10 (or 2·6 per cent.) died, and 376 were attended at their own homes, of whom 4 (or 1·0 per cent.) died. It is added in the report for this year that the diseases which proved fatal were, with two exceptions, not of the character usually considered incident to lying-in hospitals. Five of the fatal cases were admitted in the last stage of exhaustion from previous disease.

J. S. B.

LYING-IN HOSPITAL, LIVERPOOL.

LIVERPOOL LYING-IN HOSPITAL.—This is a small, but exceedingly clean, and apparently well conducted institution. It has been recently erected, and is intended for the reception of a small number of cases of disease of the female organs, and for the delivery of respectable married females.

The arrangements of the house are very much like those of an ordinary private residence. It presents a central staircase, with wards and other rooms on each side of it, and in front. The wards are well proportioned, lofty, and fairly well supplied with windows; they were perfectly sweet at the time of our visit. The wards are eight in number, four on each floor, but several of them have never yet been occupied. A small room on the first floor, with two beds, is the labour room where confinements take place, and a room on the second floor, intended to contain about six beds, is the ward for special cases. At the time of visit, there were five maternity cases only, and three special cases in the house. There is a watercloset and a bath room on each floor, well and conveniently situated.

During a period of seven years, ending with the year 1862, 1,092 labour cases have been conducted in the charity, and 11 of them have proved fatal to the mother. The causes of death are not specified, excepting in the year 1861, and in the year 1858. In the former of these three deaths, in the latter two deaths resulted from puerperal fever. The mortality is one per cent. It must not be forgotten, however, in considering the rate of mortality, that the patients admitted are expressly respectable married women.

J. S. B

MARGATE SEA-BATHING INFIRMARY.

MARGATE SEA-BATHING INFIRMARY.—This is a large building, in a beautiful situation facing the sea, with an ample space in front of it for exercise, and access to a sandy beach by an easy descent. There are also unlimited facilities for sea-bathing for such patients as are able to avail themselves of it. The rate of mortality is low, but the cases are almost, if not quite, all chronic; they are confined to scrofulous affections, and cases of advanced phthisis are excluded by the rules. The hospital building is well suited for its purpose, especially the new wings, the wards in which are very spacious and lofty; but in many of the wards the beds are far too close together; and as all the beds are kept full, or nearly so, this would prove very deleterious if it were not that most of the patients are out of doors in fine weather, and that the

windows are kept freely open during the day, and also some windows all night. The overcrowding is chiefly on the ground floor, which is kept more full than the upper on account of the number of cripples, who would find it difficult to get down stairs. The crowding was reduced last year by diminishing the number of beds from 260 to 250.

Some day rooms appear to be wanted for the reception of patients in bad weather, especially now that the hospital is kept open in the winter months.

At the time of visit the number of patients was being reduced, in preparation for the winter, so that two of the female wards upstairs were empty. The women's wards downstairs were the most crowded, and those on the female side (women and girls) on the first floor least so.

The arrangements for cleanliness (water closets, &c.) inside the building would be quite inadequate for the purposes of a hospital; but as this is more of an infirmary the patients are accommodated mostly outside the building.

The Margate Sea-bathing Infirmary is, as its name implies, an institution of a different nature from a hospital for acute diseases. It would, therefore, appear at first sight to have little bearing upon our present inquiry; but, upon reflection, this is seen not to be so. The practice and experience of this institution illustrates as well as any that could be selected the important fact that secondary hospital affections are not peculiar to any climate or situation, and cannot be avoided by placing the hospital in any position, however eligible, unless due care be taken to avoid overcrowding the wards, and to secure sufficient ventilation.

In the case of the Margate Infirmary everything is in favour of the immunity of the hospital from such complications. The patients are mostly convalescent, at least to a sufficient extent to leave their beds. Their sores (for the great majority of them have sores) are trivial, and have fallen into a chronic condition. The situation is the most perfect for pure air and isolation that can be obtained, the building standing by itself on a low hill facing the sea. Still the secondary hospital diseases do occur, though only rarely. At the time of visit there were four cases of cutaneous erysipelas in the wards. Phagedæna of a mild type is not very rare after operations, and of the 38 deaths returned in the years 1860–62 one is recorded as due to pyæmia; and the medical authorities agree that at least one other would have been so returned had the object of the return been (as of course it was not) to give definite pathological information. The reason of the occurrence of these hospital affections appears to be that the house is overcrowded. This has been felt by the governing body, who have consequently reduced the number of beds; but still the ground-floor wards contain too many beds, and seem to be almost always kept full, for in this hospital, as the patients are paid for, the want of funds operates differently from what it does in others. Many country hospitals cannot afford to keep their beds full; here they cannot afford to let them remain empty.

Operations are said to do very well here. No definite information is obtainable, but there appears every reason to think that the fact is so, since they are chiefly amputations and excisions of the elbow (those of the knee seem to have been few, and not very successful, and no account appears of other resections), and these practised on the most favourable class of cases, viz., on patients labouring under chronic disease, whose general health appears to promise recovery. Such are not the class of cases which swell the returns of pyæmia at our large hospitals.

T. H.

SOUTHPORT CONVALESCENT HOSPITAL.—This institution is close to the sea. There is a green in front, and a narrow slip of ground all round the hospital; but the grounds are more for ornament than use, as patients are allowed to go out on to the parade and beach.

The hospital is a rather large building, oblong in form, and built around a similarly-shaped court, which has been latterly bisected in its shorter diameter by a new and not yet entirely completed portion of the hospital. The present hospital has two floors, but the new portion is to have three. The ground floor contains offices, &c., but each shorter side consists of a long central corridor, with numerous apartments on either side of it for one or two beds, and in two or three instances for five or six beds apiece. Each of these apartments opens into the corridor by a door, but the wall which separates them from the corridor extends no higher than the top of the door; so that above that level the whole wing forms one continuous space. The whole of the first floor is arranged for the use of patients on the same plan. The new building contains, on the ground floor, dining and day-rooms for patients; but on the first floor it forms one large ward for the reception of females; and on the second floor a similar ward for the reception of men. The old part of the hospital has accommodation for 135 patients; the two new wards will hold 75 patients more. The ventilation is good, and effected by windows, doors, and ventilating holes in the wall. The hospital is warmed by open fire-places, and lighted by gas. The water closets are good and well drained, and well supplied with water. Drinking water is laid on to the premises. Patients, in suitable weather, bathe in the sea, bathing-machines being attached to the institution; but there are also baths on the premises.

The walls both of the wards and of the corridors are for the most part of bare brick whitewashed. They are clean and newly whitewashed once annually. The bedsteads are of iron, without posts or curtains, and are provided with straw paliasses covered with hair or flock mattrasses.

No nurses are employed, except in rare instances, patients generally being able and expected to assist one another. There are four medical officers, but none resident. The medicines are for the most part made up in the town by a dispenser. Medicines, however, for cases of emergency, are kept in the hospital. The treatment is almost exclusively hygienic and tonic.

Patients come from Liverpool, Manchester, and nearly all the northern counties, and are admitted by subscribers' letters once a week. The male beds are more numerous by eight or nine than the female beds. Acute diseases, especially those which are infectious, are excluded, and so also are cases of far advanced phthisis. The diseases for the treatment of which the hospital is designed are scrofulous affections, phthisis in its early stages, ulcers, bone diseases, dyspepsia, &c.

SPECIAL HOSPITALS.

In 1861, 1,581 patients (800 men and 781 women) were admitted. In 1862, 1,299 patients (733 men and 566 women) were admitted; the average daily number for the last year was 62½. Two patients only died.

CONVALESCENT, SOUTHPORT.

An admission into the hospital gives the patient a right to remain there for a period of three weeks; but besides in-patients, a number of poor persons have hitherto been received as out-door pensioners, being allowed 8s. a week from the charity, and being required to find themselves with board and lodging.

The diet allowed to in-patients appears to be liberal.

J. S. B.

PARIS HOSPITALS.

SUPPLEMENTARY NOTE ON THE HOSPITALS OF PARIS.

The length to which this report has already extended prevents us from entering into a detailed description of the individual hospitals of Paris. We were conducted over each of them by gentlemen connected with the public department, as well as over all the large establishments founded and maintained to supply them with medicines, bread, washing, &c., and have preserved notes referring to each hospital in particular; but as our object is only to illustrate from the Paris system the effects of sanitary regulations and circumstances on the hospitals at home, we shall endeavour to combine these notes into a general view of the peculiarities of that system, and of the effects which we conceive those peculiarities to produce.

Regulations for admission of patients.

In the first place all the hospitals at Paris are under the same system of government superintendence. None of them belongs in any manner to any private body, nor do patients require any recommendation in order to procure admission. The rule, as we understand it, is, that all the sick poor who claim hospital relief shall present themselves (by deputy if they cannot themselves attend) at the central office of the administration, at a certain hour each morning, where a medical officer of the administration, unconnected with any of the hospitals, examines the cases. The number of vacant beds in each hospital is furnished to him; and he sends the patients to each, as he judges best. This rule, however, it has been found necessary to relax, especially for those hospitals situated a long distance from the central office, and these consequently receive the greater part of their patients by direct application at their own out-patient rooms. Again, the administration has a formal right to regulate the period of stay in hospital of all patients. There is a rule in existence that officers of the administration shall make periodical visits to each hospital, and discharge all such patients as have been there more than three months, unless good cause can be shown for retaining them; but it has been found inexpedient to enforce this rule. There are no workhouse infirmaries in Paris, the *hospices* being rather refuges for destitute persons who are chiefly disabled by age, and to these the large lunatic asylums are attached.* These regulations and circumstances have a double effect. On the one hand, as all urgent cases must be received into hospital, and as the number of medical cases applying (and therefore of medical beds) is much greater than that of surgical, there is a large proportion of acute and hopeless cases admitted, and consequently a large mortality. But, on the other hand, the free reception of cases, the absence of infirmaries and other refuges for chronic invalids, and the failure of the regulations by which the administration have attempted to make each applicant pass through their office, and to limit the term of his sojourn, lead to the admission of a number of habitués of the hospitals, who spend a great part of their lives in passing from one hospital to another.† Hence, some writers, in comparing the Paris hospitals with ours,

* There is a magnificent establishment for the reception of the poor of Paris (*Les Ménages*) recently established at Issy, but this is not in any sense a hospital; it has more resemblance to an almshouse.

† This evil will in future be perhaps met by the large convalescent hospitals which are now in action at Vincennes and at le Vesinet. In the children's hospitals there are large establishments for scrofulous patients, who seem to stay an unlimited time, so that these departments of those hospitals are little more than asylums.

dwell on the greater severity of the cases admitted into them, while others are of a precisely opposite opinion. We do not feel ourselves capable of deciding this point, which indeed can only be settled by a careful and prolonged medical examination of all the cases received into Parisian and London hospitals respectively; but we believe that their general hospitals receive a greater proportion of cases of exanthematous fevers than ours, while the severity of their surgical cases is less than with us, at least if judged by the test of the frequency of the major operations.*

It must be allowed that these hospitals make a far more effectual provision for the relief of sickness in all its forms than those of London do; and the relative mortality of the two classes of institutions hardly admits of any useful comparison, in the absence of data as to the nature of the cases admitted. The great hospitals (St. Louis, le Midi, and Lourcine,) which are set apart for skin diseases and syphilis must absorb many if not most of the more chronic and trivial cases which are received at London hospitals; while, on the other hand, the necessity of providing for persons disabled by the slighter kind of affections, the absence of any out-patient treatment †, and in its own degree the presence of an obstetric department at each hospital, introduce a set of chronic or trivial cases from which our hospitals are free.

Size of the hospitals.

The hospitals of Paris are much larger than those of London, both absolutely, and still more if considered in relation to the size of the two cities.

LIST OF PARISIAN HOSPITALS.

General Hospitals.

L'Hôtel Dieu	808 beds.	Necker	351 beds.
La Charité	504 „	Saint Antoine	450 „
Beaujon	423 „	La Pitié	628 „
Cochin	112 „	Lariboisière	606 „

Special Hospitals.

Saint Louis (partly for surgery, but chiefly for patients with diseases of skin)	792 beds.
Le Midi (male venereal)	336 „
Lourcine (female venereal)	248 „
Les Enfants Malades (hospital for children)	598 „
Saint Eugénie (hospital for children)	425 „
Les Cliniques (surgical and lying-in)	97 „
La Maison d'Accouchement	130 „

Size of wards.

The wards in the older hospitals vary a good deal both as to size, form, and arrangement. Thus, as regards size, in "Les Cliniques," some of the wards contain from 4 to 8 beds apiece only, whereas in St. Louis and La Charité some hold as many as 80 beds, and from 40 to 60 is by no means an infrequent number in the wards of some other hospitals. In some hospitals, as Necker and Cochin, there are smaller wards (called annexes) attached to the larger wards. At Beaujon several of the wards are built, and others are being built, on the double plan, as used at King's College Hospital, London.‡

Cubic space.

A good deal has been said about the allowance of space to each patient in London and Paris hospitals respectively. The allowance of cubic space to each bed is given by M. Husson (*op. cit. 565*) for each hospital in Paris in great detail. It varies considerably, of course, and perhaps more so than in the London hospitals, as would be expected from the greater diversity of construction and date in the hospital buildings of Paris, but it appears generally quite sufficient. The beds, however, are usually, as it seems to us, closer together than in London hospitals. This is especially the case

* Thus in 9 London hospitals, making up 1985 surgical beds, there were performed (striking the average of three years) 190 amputations of the thigh, leg, arm, and fore-arm annually. In 12 Parisian hospitals, with 1584 surgical beds (or roughly speaking four-fifths of the above number of beds), only 102 such amputations were returned in the reports to the administration in 1861 (the only year for which we have authentic data). It is true that some cases may not have been returned, but the omissions can hardly make up the proportion. Of operations for strangulated hernia, 49 only were returned, which is below the yearly average of herniotomy at St. Bartholomew's and St. George's hospitals only. Excisions of joints, again, are much more rare in Paris than in London; in fact, those in the lower extremity are hardly practised at all; seven excisions were returned in the above year. As to lithotomy we have no information. On the whole, judging from what we saw as well as from the official documents, we have no doubt that capital operations are more common in London than at Paris.

† Out-patients receive *advice* ("consultation") at all Parisian hospitals, but they are *treated* only at St. Louis, except that at some hospitals (*e.g.* Les Enfants Malades) baths are given, which form to great a feature of treatment in France.

‡ It is singular that while we are so frequently referred to Paris as our type of whatever is good in modern hospital construction, most of the chief faults alleged against our English hospitals are paralleled by some of the proceedings of the public administration there, and those too their most recent proceedings. Thus the double wards, with the "spinal" wall, which are so strongly denounced at King's College, are being constructed at Beaujon; the closed courts, which are objected to at Guy's, are being reproduced at La Charité, &c.

in the large old hospitals. On the other hand, in the new arrangements in progress at Les Cliniques, a clear space of four yards will be left between the contiguous beds. It should always be remembered that the hospitals of Paris are, as a rule, more constantly full than those of London, the necessity for making due provision for the wants of the population frequently leading to much overcrowding. This was forcibly illustrated at the time of our visit by the condition of the Hôpital St. Antoine, in which a corridor, never intended, and quite unsuitable, for hospital purposes, had been converted into a ward; and by that of Beaujon, where the number of beds had been found too great, and the administration was in the act of suppressing some of them.

CUBIC SPACE per bed in the Hospitals of Paris (from M. Husson).

General Hospitals.

	Cubic Ft.		Cubic Ft.
Lariboisière	1938·9	Necker	1462·4
La Charité	1692·6	La Pitié	1414·5
Hôtel Dieu	1601·6	Saint Antoine	1288·1
Beaujon	1481·7	Cochin	1067·4

Special Hospitals.

	Cubic Ft.		Cubic Ft.
Cliniques	1924·0	Midi	873·0
Saint Louis	1757·4	Saint Eugenie	821·6
Maison d'Accouchement	1262·3	Enfants Malades	698·5
Loureine	1153·1		

The buildings which are used as hospitals in Paris were many of them built for other uses; e.g., St. Louis, St. Antoine, La Charité, for convents; Beaujon (the old part), Les Enfants Malades, as private houses, &c., and in many of them this has introduced difficulties in their adaptation to their present purpose. But it must not be concluded that these old hospitals are radically bad. Some at any rate of their wards may compare on at least equal terms with those of more modern pretensions. We saw many wards at Paris presenting a more finished and more luxurious appearance, but none that seemed to us more fitted for the uses of a hospital than the grand old rooms at St. Louis.

Ventilation.

As regards internal management and details, the differences between the hospitals of Paris and London are numerous and striking. In the first place, the system of ventilation which we regard as the natural one is scarcely anywhere adopted in Paris; nor, from the construction of their wards, can it be well adopted. That system consists in allowing the entrance of air into the wards by sash windows (or by valvular windows, or some such contrivance), opened to a small extent during the greater part or perhaps during the whole of the twenty-four hours, and in allowing the exit of air by means of chimneys, open fire-places, doors, &c. It is allowed on all hands that this natural system is most perfect when the windows are opposite each other. The French wards cannot be ventilated in this way, because they have no chimneys, and because their windows are ill-adapted for partial and regulated opening. Many of the medical officers of Parisian hospitals believe in the superiority of the English system of ventilation, and some have endeavoured to introduce it. We saw at la Pitié a ward in which some of the windows were left wide open. The ward was certainly far more sweet than the others in the same hospital, or than those in other hospitals, but the current of air was very powerful (the window being the "croisée" in ordinary use in France), and to the man in the next bed the plan was almost equivalent to lying in the open air. In the Maison d'Accouchement, also, the plan of freely opening the windows in the daytime has been recently introduced. In other cases we have noticed the wards to be fresh, in consequence of the nurse's room at the end having an open window; but these are exceptions. Most of the old hospitals have no natural and but little artificial ventilation. The windows are all kept closed, except for a short time in the morning, when the foul air is let out of the wards to prepare them for the early morning visit; and the only means of accessory ventilation is by the stove, which is surrounded by an air-chamber, communicating with the outer air. The air in this chamber passes into the ward by reason of its higher temperature and lighter specific gravity. In most of the new hospitals, however*, there are elaborate systems of artificial ventilation, which as mechanical inventions are highly creditable to the engineers who have devised them†, but which we need not further describe, as those in use at the Hôpital Lariboisière (see page 742) are types of all of them. They seem

* As Lariboisère, St. Antoine (new part), Necker, Beaujon, Le Vesinet (convalescent hospital), &c.

† This is, we believe, true of most of these systems; but some of them are obviously defective in their action. Thus in one of the hospitals enumerated in the last note, while the corridors on the upper floors were perfectly sweet, those on the ground floor were poisoned by the smell of the latrines, which was so powerful that there must have been a forcible artificial current from the latrines into the corridor. A paper has recently been written by Mr. Berkeley Hill (Brit. and For. Med. Chir. Review, July 1864) on the subject of the ventilating machinery used in hospitals, which will repay perusal.

to us, however, to have entirely failed of attaining the sanitary end proposed, for there is no proof that the wards of the hospitals where they are in use are more healthy than those of the other hospitals, nor is there any proof to the senses that the air is sweeter.

Many of these mechanical systems of ventilation are also made to serve for heating, by passing the air over hot surfaces before supplying it to the pipes opening into the wards. As to this nearly the same observations will occur to the English visitor. It is impossible not to admire the ingenuity of the machinery, or to avoid regretting that so much ingenuity should be (to our thinking) wasted upon doing only a portion of the work which our open fire-places accomplish.*

On the whole, the wards of the hospitals at Paris are certainly less airy and sweet than those of London, and this fact has also been pointed out by MM. Blondel and Ser.†

But it must not be forgotten that the atmosphere of their wards receives some contaminations from which that of ours is free. In the first place, the "latrines" are, in most of the hospitals, very filthy, and the offensive odour from them is distinctly perceptible in the wards. The defects of these places are fully recognised by the authorities‡, and many attempts are being made to correct them; but the habits of the French poor (in this respect less cleanly than those of English hospital patients) render these attempts difficult, and the want of any sewerage at Paris § offers a still more serious difficulty to the construction of proper waterclosets for hospital use. Warming. Latrines.

The floors are generally waxed and polished, and beautifully clean; in some of the older wards tiled floors are still in use. The walls and ceilings of all the new hospitals and of those which have been recently renovated are made of non-absorbent materials, and in some (as at the Hôpital Necker) are highly ornamental, being made in stucco to imitate various kinds of marble.‖ The walls and ceilings, however, of some of the older hospitals are dingy and dirty; and indeed it would seem, that although the French hospitals are done up in the beginning with admirable taste and effect, thorough cleansing is rarely performed, and the hospitals are generally allowed to fall into an unseemly condition. On the subject of the cleansing and changing of the bedding and furniture, we were informed that the curtains are changed in all the hospitals twice a year; but as to the cleansing of the bedding we received different information from the officers of different hospitals. A gentleman attached to one of the larger hospitals told us that the mattresses were very rarely changed or cleansed; while, on the other hand, we were assured at Les Cliniques and at Beaujon that all the bedding was changed after every offensive case. The bed linen is changed more frequently than in our hospitals, and is much whiter and better. Whilst on the subject of cleaning, we ought to notice that this duty, and that of supplying the patients with medicines, food, &c., is performed by men in the female as well as the male wards. Cleansing.

The nursing of each hospital is undertaken by a community of nuns, who inhabit a portion of the hospital building. The practical working of such a system it would take a long time to appreciate. In our cursory visit we saw of course only its good side; but as the plan is one which is inapplicable to this country we did not investigate the relations between the administration and each of these communities, the provisions in cases of possible neglect or misconduct, and the many other questions which such a system suggests. Nursing.

The diet at French hospitals is far more various than at ours, and appeared to us to be more appetising, and also to be very liberal. The actual allowance for each kind of diet is given in M. Husson's work, pp. 243, 4. A considerable portion of very good wine, and an allowance of good soup twice a day, form parts of all ordinary diets. We were much surprised, therefore, to hear from some hospital officers (whose names we are not at liberty to mention) that they considered the diet insufficient. If it is so, it certainly appears to be from no fault of the administration, which in this, as in all matters affecting the health and comfort of the administrés, appears to spare neither pains nor money. Diet.

The arrangements and furniture of a French ward are more luxurious and agreeable to the eye than ours are; there is more furniture, and that of a better and more ornamental kind; each bed has a spring mattress and an abundance of curtains all Ward furniture, &c.

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* In one of the large wards at St. Louis there are two great open chimneys, but they are not liked. Still these wards are sweeter than the others. They have, however, ventilating holes also.

† "Nous déclarons très volontiers que nous n'avons point reconnu, dans les Hôpitaux de Londres, "l'odeur particulière aux salles de malades, si fréquente dans nos établissements."—Blondel et Ser. "Rapport sur les Hôpitaux Civils de la Ville de Londres." Paris, 1862, p. 85.

‡ Blondel et Ser, op. cit., p. 93.

§ The égouts are *drains* only, for the surface water, &c.

‖ It may be questioned whether these beautiful polished walls have not one drawback, viz., that they do not by their dirtiness or want of repair compel the periodical evacuation of the ward, a provision which we regard as tending very much to its healthiness. In all the Parisian hospitals there seems a great tendency to postpone the emptying of the wards as long as possible, so that it is often put off till the dirty and peeled condition of the plaster renders it imperative. It may be surmised that with these non-absorbent walls, that will last an unlimited time, there will be still further difficulty in getting the wards emptied. The importance of periodically emptying the wards is peculiarly recognised at the great obstetric hospital (Maison d'Accouchemens), and strictly enforced.

round, and many have feather cushions (édredons), and there are many other little comforts provided which seem not to be thought of in English hospitals. Most of these differences are the result of different national manners, and as regards health are of little moment. It is obvious, however, that the superabundant curtains oppose ventilation, and one cannot but suspect that they must absorb poisonous emanations, and thus have an injurious effect.

The subordinate arrangements of the Parisian hospisals are admirable. Those who are familiar with the simple, and, to say the truth, rather scanty domestic departments of our English hospitals, will be astonished at the great stores of linen, the vast establishments for washing, ironing, and drying, the extensive kitchens and other offices which those at Paris possess. This care and expense no doubt is recompensed by the increased comfort of the patients.

Nor should we omit to mention with special commendation the beautiful system of baths which is in use at all the modern hospitals at Paris. This, however, is as much a difference between English and French medical practice as between their respective hospital systems.

Health.

What then, if any, is the effect of these differences? Do they tend to make the hospitals of Paris more or less healthy than those of London? The death-rates at all the hospitals of Paris appear high, and generally higher than in the hospitals of London. But it seems tolerably certain, as M. Husson has shown, that the higher mortality of the hospitals in Paris depends almost entirely on the different proportion of medical and surgical cases from what exists in London. The table which we append gives the figures for each hospital in the year 1862, with the number of patients received and the number of deaths.

A TABLE to show the Number of Wards, Beds, Patients admitted, and Deaths in each of the Parisian Hospitals for the Year 1862.

—	Beds.	Total Sick.	Total Died.	Per-centage of Deaths.
Hotel Dieu.				
Medical Wards - 18	505	7309	1059	14·48
Surgical „ - 6	231	3370	188	5·57
Accouchement „ - 2	52	1050	33	3·14
Total - 26	808	11729	1280	10·91
Pitié.				
Medical Wards - 12	428	6048	914	15·11
Surgical „ - 6	169	1860	109	5·86
Accouchement „ - 2	31	535	21	3·92
Total - 19	628	8443	1044	12·36
Charité.				
Medical Wards - 12	354	5548	630	11·35
Surgical „ - 4	150	2198	96	4·36
Total - 16	504	7746	726	9·37
St. Antoine.				
Medical Wards - 10	353	5483	668	12·18
Surgical „ - 3	83	1342	102	7·06
Accouchement „ - 1	14	363	19	5·23
Total - 14	450	7188	789	10·97
Necker.				
Medical Wards - 10	246	3510	479	13·64
Surgical „ - 2	77	789	69	8·74
Accouchement „ - 1	28	604	30	4·96
Total - 13	351	4903	578	11·78
Cochin.				
Medical Wards - 3	61	983	136	13·83
Surgical „ - 2	51	459	38	8·27
Total - 5	112	1442	174	12·06

—	Beds.	Total Sick.	Total Died.	Per-centage of Deaths.
Beaujon.				
Medical Wards - 11	226	3715	515	13·86
Surgical „ - 9	179	2045	155	7·57
Accouchement „ - 1	18	476	19	3·99
Total - 21	423	6236	689	11·04
*Lariboisière.**				
Medical Wards - 11	374	5620	845	15·03
Surgical „ - 6	204	2800	209	7·49
Accouchement „ - 1	28	823	39	4·74
Total - 18	606	9243	1093	11·92
St. Louis.				
Medical Wards 14	604	5159	124	2·40
Surgical „ - 3	156	1425	92	6·44
Accouchement „ - 1	32	735	59	8·02
Total - 18	792	7319	275	3·75
Lourcine.				
Total Wards - 8	248	1414	18	1·26
St. Eugenie.				
Medical Wards - 8	320	2561	409	15·97
Surgical „ - 2	105	754	62	8·22
Total - 10	425	3315	471	14·20
Cliniques.				
Surgical Wards - 6	61	685	45	6·76
Accouchement „ - 6	36	873	73	8·35
Total - 12	97	1538	118	7·67

* During part of 1862 three small supplemental wards were used, admitting 80 patients, of whom 24 died. These are not counted in the number of beds.

A TABLE to show the Number of Wards, Beds, Patients admitted, and Deaths in each of the Parisian Hospitals for the Year 1862—*continued*.

—	Beds.	Total Sick.	Total Died.	Per-centage of Deaths.	—	Beds.	Total Sick.	Total Died.	Per-centage of Deaths.
Maison d'Accouchement.					*Enfants Malades.*				
Total Wards - 8	130	2413	166	6·88	Medical Wards - 14	600	2918	495	16·97
Midi.					Surgical „ - 3	98	812	51	6·28
Total Wards - 13	336	3883	19	0·48	Total - 17	598	3738	546	14·64

These statistics are of little value (as we have pointed out above) for comparing the health of Paris and London hospitals. The only use to which, as far as we can see, they can be fairly put, is to compare these death-rates with each other, as being taken from hospitals which may be assumed to receive about the same class of patients. In this point of view the differences will be seen to be trivial, and are probably merely accidental. A comparison between the figures from the Hôtel Dieu, La Charité, and La Pitié (which are all large hospitals containing a great number of sick aggregated under one roof), and those from Les Cliniques, Cochin, and Laribosière (of which the two former are small hospitals, and the latter accommodates its sick under separate roofs), will show how little support is given by statistics to the assertion that there is any proved danger in accumulating more patients than 100 under one roof, or any proved advantage in the opposite course.

The prevalence of secondary hospital affections, and the relative success of surgical operations, are the chief points, as far as we can see, upon which any useful comparison can be instituted. On both these heads we have received evidence which is, we think, sufficient to justify us in asserting that the Parisian hospitals are far more infested with hospital affections than those of London, and that surgical operations are followed by greater mortality. We would refer, in the first place, to the opinion of numerous hospital surgeons in Paris, who agree in saying that their hospitals are never free from such affections. In the next place, the public statistics show a number of cases recorded as breaking out in the hospitals, and a number of deaths from erysipelas and pyæmia developed in hospital, far beyond similar records in London.* The statistics of operations collected by the administration show a very high per-centage of deaths, as may be seen by the annexed table, which we have copied from the archives of the administration, by the kind permission of M. Husson.

AMPUTATIONS for 1861.

—	THIGH.						LEG.					
	Total.	Traumatic.	Pathological.	With Complication.	Deaths.	General Mortality.	Total.	Traumatic.	Pathological.	With Complication.	Deaths.	General Mortality.
Hôtel Dieu - -	5	2	3	2	3	60·00	6	.	6	3	3	50·00
Pitié - - - -	2	.	2	.	1	50·00	4	4	.	3	2	50·00
Charité - - -	1	.	1	1	1	100·00	2	1	1	1	1	50·00
St. Antoine - -	4	3	1	2	4	100·00	9	6	3	1	4	44·44
Necker - - -	2	1	1	2	1	50·00	5	.	5	4	5	100·00
Cochin - - -	.	.	.	.	.	..	3	3	.	3	3	100·00
Beaujon - - -	.	.	.	.	.	..	3	3	.	2	3	100·00
Laribosière -	11	7	4	2	9	81·82	4	1	3	2	3	65·00
St. Louis - - -	3	1	2	.	2	66·67	8	5	3	5	6	75·00
Les Cliniques -	2	1	1	.	2	100·00	3	1	2	1	2	66·66
Enfants Malades	1	.	.	.	1	100·00	.	.	.	.	.	..
St. Eugénie - -	4	1	3	.	2	50·00	.	.	.	.	.	..
Others - - -	.	.	.	.	.	..	3	2	1	3	3	100·00
Total -	35	16	19	10	26	74·28	50	31	19	28	35	70·00

* As an instance of the prevalence of these affections we will take the surgical experience, as reported to the administration, of the Hôpital Laribosière, in which such affections are at least as common (if not more so) as in the older hospitals. In 1861, in six wards which contained an aggregate of 204 beds, admitting about 2800 patients, with 209 deaths, there were noted 58 cases of erysipelatous affections originating in the hospital, 37 of which proved fatal, and 16 deaths from pyæmia: that is to say, more than a quarter of the surgical deaths were noted down as due to hospital affections; and it must be remembered that others must have occurred which were not noted.

APPENDIX, 3

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SUPPLEMENTARY NOTE ON THE HOSPITALS OF PARIS.

Amputations for 1861—*continued.*

	UPPER ARM.						FORE-ARM.				
	Total.	Traumatic.	Pathological.	With Complication.	Deaths.	General Mortality.	Total.	Traumatic.	With Complication.	Deaths.	General Mortality.
Hôtel Dieu	1	.	1	.	.	..	1	.	1	.	..
Pitié	2	.	2	.	.	..	.	.	.	.	..
Charité	2	.	2	1	1	50·00	.	.	.	.	..
St. Antoine	1	1	.	.	.	..	1	1	1	1	100·00
Necker	.	.	.	.	.	..	.	.	.	.	..
Cochin	.	.	.	.	.	..	.	.	.	.	..
Beaujon	.	.	.	.	.	..	.	.	.	.	..
Lariboisière	4	2	2	3	3	75·00	.	.	.	.	..
St. Louis	.	.	.	.	.	..	2	.	.	.	..
Les Cliniques	.	.	.	.	.	..	.	.	.	.	..
Enfants Malades	1	.	1	.	.	..	.	.	.	.	..
St. Eugénie	2	.	2	1	1	50·00	.	.	.	.	..
Others	..	.	.	.	.	..	.	.	.	.	..
Total	13	3	10	5	5	38·45	4	1	2	1	25·00

	DISARTICULATIONS OF THE HIP, KNEE, AND ANKLE. (Not distinguished from each other.)					RE-SECTIONS, 1861.					HERNIA. (Nature of Hernia:—I, inguinal; F, femoral; U, umbilical; X, not specified.				
	Total.	Traumatic.	Complicated.	Deaths.	Mortality per Cent.	Total.	Traumatic.	Complicated.	Deaths.	Mortality per Cent.	Total.	Nature.	Complicated.	Deaths.	Mortality per Cent.
Hôtel Dieu	1	.	.	.	..	.	.	.	.	..	6	I 4, F 1, X 1	2	3	50·0
Pitié	.	.	.	.	..	.	.	.	.	..	7	I 3, F 3, U 1	3	5	71·4
Charitié	.	.	.	.	..	.	.	.	.	..	7	I 4, F 3	4	7	100·0
St. Antoine	.	.	.	.	..	.	.	.	.	..	2	I 1, X 1	.	2	100·0
Necker	.	.	.	.	..	.	.	.	.	..	3	F 2, X 1	.	3	100·0
Cochin	1	.	.	.	..	.	.	.	.	..	.	..	.	.	..
Beaujon	.	.	.	.	..	.	.	.	.	..	2	..	.	1	50·0
Lariboisière	.	.	.	.	..	.	.	.	.	..	.	I 8, F 4	1	11	91·6
St. Louis	.	.	.	.	..	4	.	2	2	50·0	6	X 6	.	1	16·6
Les Cliniques	.	.	.	.	..	1	.	1	1	100·0	1	X 1	.	1	100·0
Enfants Malades	1	.	1	1	100·0	.	.	.	.	..	.	..	.	.	..
St. Eugénie	.	.	.	.	..	1	.	.	.	..	2	I 1, U 1	.	.	..
Others	.	.	.	.	..	1	.	.	.	..	1	X 1	1	1	100·0
Total	3	.	.	1	33·33	7	.	3	.	42·85	49	I 31, F 14, U 2, X 12	11	35	71·4

	Disarticulations of Bones of Foot, Metatarsal Bones, and Phalanges.					Disarticulations of Bones of Hand, Metacarpals, and Phalanges.				
	Total.	Traumatic.	Complicated.	Deaths.	Mortality per Cent.	Total.	Traumatic.	Complicated.	Deaths.	Mortality per Cent.
Hôtel Dieu	4	3	-	.	..	11	1	3	.	..
Pitié	3	1	.	1	33·3	15	8	4	2	13·33
Charité	2	.	.	.	..	12	2	1	1	8·33
St. Antoine	1	1	.	.	..	6	3	.	.	..
Necker	.	.	.	.	..	1	1	1	.	..
Cochin	2	1	.	1	50·0	1	.	.	.	..
Beaujon	2	1	.	1	50·0	3	1	.	.	..
Lariboisière	2	1	.	.	..	6	2	1	.	..
St. Louis	3	.	.	.	..	2	.	.	.	..
Les Cliniques	2	1	.	.	..	2	1	.	.	..
Enfants Malades	.	.	.	.	..	.	.	.	.	..
St. Eugénie	1	.	.	.	..	1	.	.	.	..
Others	2	.	1	2	100·0	3	.	.	1	33·33
Total	24	9	1	5	23·3	63	19	10	4	6·35

Another Table gives the disarticulations of the upper extremities. There are five cases, viz., Pitié, Cochin, Lariboisière, Les Cliniques, and St. Louis, one each. Four were traumatic and one pathological; four are returned as complicated: all died. They were probably all at the shoulder joint.

The above tables it is allowed are incomplete; that is to say, cases of operation have been omitted. But this has been done rather by accident than design. It is doubtful, therefore, whether, if the omissions had been included, the death-rate would have been modified. We consulted some of the most eminent surgeons of Paris, and they appeared to agree, that the conclusions are not extraordinary. Those most *intimately* acquainted with operative practice in the Paris hospitals see nothing to surprise them in these statistics. The statistics given by M. Nélaton in his Élemens de Pathologie Chirurgicale vol. 1. p. 237, and originally published by M. Malgaigne in the Archives Générales de Medjeine for April 1842, and which appear to be regarded as authentic by both these eminent surgeons, give rates which though differing from the above are still very high:—

Viz, in the amputation of the thigh 62 per cent. instead of 74
" leg 55 " 70
" arm 45 " 38
" forearm 28 " 25

As M. Malgaigne's researches extended over a longer time, and embrace larger numbers, they may be taken as more nearly approximating to the truth.

Again, the very high mortality of amputations is so impressed on the minds of the surgeons that some of the most eminent among them never perform such operations, unless the necessity is absolutely undeniable. Finally, we may perhaps be pardoned for surmising that the eccentric plans by which some surgeons in Paris endeavour to avoid the use of the knife can only be explained by the fact that operations are not very successful. If a surgeon had been in the habit of using the knife in lithotomy with the same success as follows that operation in England, he would hardly be tempted to operate with the écraseur. We merely use this as an illustration of a matter of which many others might be given. In conversing with one of the most justly esteemed surgeons of the Parisian hospitals, we learnt from him that he was quite of the opinion that operations are more freely performed in London than in Paris hospitals because they are more successful in the former. All the surgeons whom we saw appeared to agree that the bulk of the mortality was due to pyæmia chiefly, and next to erysipelas. If this be so, it brings us back simply to the consideration, why should these hospital diseases be more prevalent in Paris than in London hospitals? That other causes may be at work we neither affirm nor deny, and that the less simple

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method of dressing wounds in France has a tendency to foster suppuration and induce hospital diseases is very probable; but we believe that the privation of fresh air is the main cause, and that this cause is sufficiently prominent to overlie and conceal any others which may be concurring with it. That the absence of fresh air in a hospital is equivalent to the presence of foul air is almost a truism. That closing the windows and chimneys will make a hospital unhealthy, which may be restored to health by merely opening them, we have shown by examples from home*; examples which prove at the same time that artificial ventilation will not replace the natural method under such circumstances.

The obstetrical department of the Paris hospitals forms a special feature of distinction between the Paris and English hospitals. All the general hospitals and several of the special hospitals have wards devoted to the reception of labour cases, and there is also a lying-in hospital, the "Maison d'Accouchement." The death-rate amongst the females delivered in these institutions is generally much greater than in the lying-in hospitals of Great Britain, and far greater than that among the general population, among whom it is frequently no higher than ·3 or ·2 per cent. The accompanying table shows this, and at the same time the degree in which puerperal fever aids in producing this excessive mortality. There can be little doubt that the same causes which raise the mortality among surgical cases tend partly to raise it amongst these; but it must not be forgotten that a large proportion of the patients are unmarried and primiparæ.

MEDICAL STATISTICS of the Obstetrical Department of the Paris Hospitals for 1862.

	Delivered in Hospital.	Left without being delivered.	Total.	Dead.	Per-centage of Deaths.	Cancer of Os Uteri.	Small-pox.	Laryngitis.	Pneumonia.	Diarrhœa.	Abscess of Ovary.	Phthisis.	Eclampsia.	Heart Disease.	Metrorrhagia.	Typhoid Fever.	Total.	Total died from Puerperal Fever and Peritonitis.	Per-centage of those dying of Puerperal Fever.
Hôtel Dieu - -	895	141	1036	32	3·57	.	.	.	.	.	2	1	1	1	1	.	6	26	2·9
Pitié - - -	463	42	508	26	5·57	.	.	.	1	1	.	.	.	.	.	.	3	23	4·9
Charité - -	270	5	275	24	8·88	.	1	.	.	1	.	2	1	.	2	.	7	17	6·3
St. Antoine - -	314	41	355	21	6·68	.	.	.	1	.	.	.	.	.	.	.	1	20	6·3
Necker - - -	212	7	219	16	7·54	.	2	.	.	.	.	2	1	.	1	.	6	10	4·7
Cochin - - -	22	3	25	3	13·63	.	.	1	1	.	.	.	.	.	.	.	2	1	4·5
Beaujon - - -	275	14	289	15	5·45	.	.	.	.	.	.	2	.	.	.	1	3	12	4·3
Laribosière- -	818	78	896	34	4·15	.	.	.	2	1	.	3	1	.	2	.	9	25	3·1
St. Louis - -	694	63	757	63	9·07	.	.	.	.	.	.	1	1	.	.	.	2	61	8·7
Les Cliniques -	769	65	834	73	9·49	1	2	.	3	.	1	.	2	.	3	.	12	61	7·9
Maison de Santé -	32	.	32	3	9·37	1	1	.	.	.	.	.	.	.	.	.	2	1	3·1
Maison d'Accouchement -	2204	99	2333	166	7·53	3	1	1	4	2	3	4	1	1	.	2	22	144	6·5
Total -	6971	558	7529	476	6·82	5	7	2	12	5	5	16	8	2	10	3	75	401	5·7

The impression produced upon our minds by our visit to the hospitals at Paris was, that in the great and essential features of the admission of patients, and the proportioning of the beds between medicine and surgery, our system might be usefully approximated to theirs; that the health of their hospitals would probably be much improved if it were possible for their system to be approximated to ours in the matters of ventilation, water-closets, and drainage; and that in all the minor and domestic details of hospital management their system is far in advance of ours. We believe also that the experience of Parisian hospitals shows beyond question how slight is the importance of such details as the site, the shape, the arrangement, and the size of the hospital, in comparison with the class of cases which it admits, and the provisions for ventilation and cleanliness. But although we derived from this visit a strong conviction that the "pavilion principle," as applied to hospital construction, is a matter of minor importance, we are quite ready to admit that the experience of the Parisian hospitals (Lariboisiére and Beaujon), which are constructed on that principle, is not sufficient to settle the question, inasmuch as their habit of keeping the windows closed, and trusting to artificial ventilation, is obviously in opposition to the main intention of that principle, which is, to admit the external air pure into all the wards by opposite windows; a most salutary provision, which, however, can, we believe, be also secured by other plans of construction.

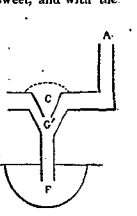
We add a more detailed description of the two most interesting of the hospitals of Paris.

* See Summaries of York County Hospital; Edinburgh Royal Infirmary.

THE HÔTEL DIEU is now in the course of demolition and reconstruction. There are four large buildings separated from each other by small streets and by a branch of the river. In the first or oldest block of buildings the wards are very long, running the whole length of the block, and divided into two parts by a row of pillars supporting the roof; between these pillars a third row of beds is placed, the two others being ranged along the wall. The roofs are low, and the wards dark and old. These wards describe a slight curve. The beds are rather close together, and surrounded by curtains, but having the top open. There are numerous windows, which reach nearly to the top of the ward, and are opposite to each other. This seems the case throughout the house. In the second block the ceilings are of beams of wood; and in this, as in the other two blocks, the wards are lofty, with large and numerous windows, and only two rows of beds, sufficiently separated from each other. All the wards are warmed by stoves, without any other artificial heating. These stoves were not alight at the time of our visit. The temperature, without any artificial warmth (the day being very mild), was 67° F. The floors are all waxed and polished throughout the hospital. There are very few arrangements for the convenience of patients out of bed. In the surgical wards hardly any patients were out of bed; perhaps two or three in the whole of a large ward. The furniture of the wards is more comfortable than in our hospitals, each bed being furnished with a spring mattress, and most with éiredons, and the chairs, &c. being less rough and uncomfortable than in our wards. The bedsteads are all with springs. They are placed at a good distance from each other in the modern parts of the hospital, and always at such a distance from the wall as to allow a free passage behind them. At the head of each bed, within the curtains, is a shelf, on which the patient's food, medicine, &c. are placed.

There are some singular arrangements for dressings, especially a large closet on wheels, containing all kinds of ointments, bandages, minor surgical instruments, such as bougies, &c. &c., which is rolled round after the surgeon as he makes his visit, in order that he may find everything he wants ready to his hand. The windows were almost all closed at the time of our visit, and this is said to be their constant condition; both the patients and the doctors will have them shut if any one has set them open. The wards appeared to us uncomfortably warm and close smelling. There is no artificial ventilation in some of the wards. In others, when the stoves are alight, they produce a current of air into the wards, and the foul air is carried off by holes in the walls; but this has little effect. The windows are defended on the outside by wirework, which gives rather a sombre appearance, but is necessary, it is said, to prevent suicides. In one of the new hospitals the wire-work was at first left out; but two or three delirious patients having thrown themselves out of window in the night, it was necessary to put it up. Nothing can be conceived more horrible than the "latrines" in this hospital. They are flushed with water from time to time; but they have no drainage, and therefore can never, under any system, be made sweet, and with the habits of the French common people they are intolerable.

The system in use at the Hôtel Dieu is represented in the margin: C is the pan or cuvette C′ a second cuvette below it leading into the cesspool or fosse F; C being covered when not in use (as indicated by the dotted line), it is intended that the foul air should rise from the cesspool into the interval between the two pans, and be conveyed away into the outer air by a chimney indicated by the tube A. The cesspool is emptied from time to time. It is unnecessary to remark on the defects of this arrangement. The latrines open out of the corners of the wards. In the newer parts of the hospital, there being no central rows of beds, and the roofs being higher, the wards are more airy; but there is a decided odour of hospital in all of them, and the same defects of windows, ventilation, and latrines exist. As to fire-places, there are no open chimneys in the building, and this must add to the closeness of the wards in winter. The walls are plaster, and rather dingy. It does not seem that there are any regular periods for emptying and thoroughly cleansing the wards, nor that this is, in practice, done so often as once a year.



The service of each ward and of each department (e. g. kitchen, washhouse, &c.) is superintended by a nun from an order of sisters who live in the building in the two upper stories of the first or oldest block. There are also male and female nurses in each ward, but in the male ward the service is chiefly done by men, while in the female ward there is only one man to bring up the provisions, and medicines, and to attend to the floors, the latter being of course waxed and dry rubbed.

The kitchens are large and excellently managed; but from the great variety of the articles of diet, and the great extent of the hospital, with buildings separated by bridges, corridors, and streets, it necessarily takes a considerable time to distribute all the diets. This time is estimated at half an hour, and if it is done in that time it is surprisingly rapid. If the food has got cold it is heated up in the wards.

The dead house is very dark, and the post mortem room is an underground cellar lighted with gas.

It should not be forgotten that only one out of the four buildings is meant to stand. This had been intended to form part of a pavilion hospital, like Lariboisière, but the idea has been abandoned or postponed, some newer principle having found more favour with the authorities.

The whole number of beds in the hospital is 808, and almost all are generally occupied, so that the average of patients appears to be nearly 800.* The beds are arranged in the proportion of rather more than two for medicine (including lying-in women) to one for surgery.

SUPPLEMENTARY NOTE ON THE HOSPITALS OF PARIS.

As to the healthiness of this hospital it seems to be neither much above nor much below that of other Parisian hospitals. In all of them hospital diseases are common, and cases of grave surgical operation do badly; but the published statistics do not prove that this is the case at the Hôtel Dieu to any greater extent than at the other hospitals.† The wards for lying-in women have been closed thrice in 1863, on account of puerperal peritonitis; and erysipelas and other surgical complications appear to be very frequent, so that the surgeons seem to avoid operative measures.

LA RIBOISIÈRE.

LA RIBOISIÈRE.—(Plans in M. Husson's Étude sur les Hôpitaux, page 9.) This hospital is the model of the pavilion system. It is formed of 10 blocks of buildings of three stories each, viz., a ground, first, and second floor. Six of the blocks are used as wards, the others for the lodging of the nuns and of the officials. The blocks are united on the ground floor by corridors, which have attached to them, in the intervals between the blocks, some rooms intended originally as refectories for the patients able to leave their beds, but which have now been disused for this purpose; and some of them are out of use; others used as workshops, for making up bedding, and other purposes. The dining rooms were objected to equally by the patients, the religieuses, and the medical attendants. They seem to have been found cheerless, and an obstruction to the regularity of the hospital service. They are now available as extra wards when required. There is also communication between all the parts of the building by means of a terrace running along the connecting pieces and outside the ends of the blocks, and opening out of each of the principal staircases. Between the blocks are small gardens for the use of the patients, opening out of a larger piece of ground, which runs the whole length of the hospital on either side, one side serving for males, the other for females. The wards are very fine and beautifully finished. They are broad and high; the floors waxed and polished; the walls and ceiling made of stucco, painted and polished, looking very cheerful. The windows are opposite each other, and between each two windows are a pair of beds rather close to each other‡, all hung with white dimity curtains (which are changed twice a year, and serve both summer and winter). The tops of the beds are left open; they are placed with their backs touching the wall. Down the centre of the ward are arranged the stoves (four in number), the tables for dressings, the oratory, &c. The tubes for air and warm water also run in the centre under the floor. At the end of the chief ward is a lobby, from which opens, on one side, a small ward, with two beds for violent, offensive, or highly contagious cases; and on the other side the latrines and a small scullery. The latrines are little better than at the Hotel Dieu, and are horribly offensive. The windows of the wards appear never to be opened, except for a short time in the morning; but there is an elaborate system of ventilation in use, both on the male and female side. That on the female side is the simpler of the two, and is called the system "par aspiration." It is in full use only when the stoves are warmed. These stoves consist of a series of hot-water pipes, and an open chamber around them, communicating with the ward by a grating in the top of the stove. The air in this chamber being heated by contact with the hot-water pipes is thus made lighter than the air in the ward, and rises into the ward, thus giving the latter its supply of pure air. The foul air is removed by a series of tubes opening in the wards by means of ventilating holes along the floor, and half way up the wall. All these tubes communicate with a central chimney, in which there is also a series of hot-water pipes. Thus the air in the chimney is heated and made to rise, and so the central chimney becomes a sucker to draw the air out of each ward (vide Husson, p. 56). This system is said to act, but it is allowed that its action varies according to the temperature and the state of the weather. The other system, which is in use on the male side, is more effective. A large pump, or fan, driven by steam-power in the basement of the building, draws in pure air by means of a chimney from a considerable height. The volume of air drawn in varies with the rapidity of the revolution of the fan. There are two engines, to provide for the

* Number in the house January 1, 1861 - 785
" Ditto January 1, 1862 - 794
Compte morale de l'Administration.

† See the statistics quoted on p. 863.

‡ The distance of contiguous beds in the same pair is 2½ feet, and of contiguous pairs 7 feet.

continuity of the service in case of one wanting repair; and in case both are driven at the same time a great increase in the volume of air would be obtained. This air is thence driven through a central shaft, which branches out to supply each ward, having a separate tube for each stove. The air conveyed in these tubes comes in contact with the hot-water pipes supplying the stove in the floor of the ward, and is further heated by contact with the system of pipes composing the stove, from whence it passes into the ward. The exit of air is provided for by a similar arrangement of holes and chimneys, but without any heating arrangement for "aspiration." The quantity of air injected can be regulated for the whole hospital by moderating the action of the fan, or for single wards by partly closing the tube for that ward by means of a diaphragm. This system injects into each ward a quantity of air which can be measured to be equal to between 60 and 80 metres cube of air per bed and per hour. As to the quality of the air, it passes rapidly from a considerable height into the ward, but may possibly become somewhat tainted in the rather close passages and underground cellars through which it is driven. This, however, can hardly be of much importance. What the value of the arrangements for removing the vitiated air may be is a more difficult question. It is said that in the system "par aspiration" the air in the chimneys of exit smells powerfully of the hospital atmosphere; but it is a matter of opinion whether this fact, if true, proves much. At the time of our visit all the wards smelt tolerably sweet, and were sufficiently cool; but they were not so fresh and pleasant as they might have been made by open windows. The expense of constructing the machinery we were informed was about half a million of francs, and it costs about 47,000 francs per annum to keep it in motion; but the machinery supplies steam and hot water also to the lavatories and baths. The arrangements in both the latter departments are very excellent, but perhaps hardly concern our present purpose. The dead-house and other arrangements for post mortem purposes are simple and good.

The out-patient department is merely for consultation in this as in all other Parisian hospitals, except St. Louis, where medicine is given. Such out-patients as are thought bad enough are taken in; the others have a prescription, and are sent away.

It seems that, in spite of the beautiful appearance of the wards and all the other parts of the hospital, the results are not found satisfactory, since the plan is not imitated in the newer constructions (vide Hôtel Dieu); nor have the results, as published, shown that any improvement has been obtained on the older hospitals in the results of operations or in the prevalence of hospital diseases. The subordinate arrangements of the hospital, such as those for washing, drying linen, patients' bathing, exercise, &c., appeared admirable, and are far more elaborate than anything of the kind in English hospitals.

J. S. B. T. H.

No. 16.
Dangers in the Sale of Drugs and Poisons, by Dr. A. Taylor, F.R.S.

No. 16.—Professor ALFRED S. TAYLOR'S REPORT on POISONING, and the DISPENSING, VENDING, and KEEPING OF POISONS.

I.—TO WHAT EXTENT IS INJURY OCCASIONED BY THE CARELESSNESS AND INCOMPETENCE OF PERSONS EMPLOYED IN RETAILING DRUGS?

In reference to this question, I understand that the answer should apply to injury affecting health and life, and that the retailing of drugs refers particularly to the dispensing and vending of drugs and medicines.

Considering this question in its broadest aspect, the first point to which I would refer is, that a large number of persons wholly unacquainted with the properties of powerful drugs and medicines, are allowed to retail them to the public, on demand, without any check or control. Persons who have had no professional education as druggists, and acting as oilmen, grocers, or village shopkeepers, keep for sale laudanum, tincture of rhubarb, senna, black draughts, &c., and either from carelessness in placing the bottles containing these medicines near to each other, or from ignorance, supply laudanum for the tinctures above mentioned, and thus either injure health or destroy life. A friend of mine having sent to a village shop where drugs were sold, for an ounce of tincture of rhubarb, was supplied with laudanum in place of it, and having swallowed it, narrowly escaped with his life. The medicinal tinctures above mentioned are similar in colour to laudanum, and are therefore liable to be mistaken for it; the odour is, however, very different. When it is considered that the bottles are for convenience of retail sale kept near to each other, and generally on the same shelf, and

further that the proprietors of the shop frequently entrust the sale of them to boys and girls, some of whom cannot read, it is not surprising that fatal mistakes should be frequently made. The case which I have related above is the type of many which occur annually, but of which the public hear but little, because as recoveries are numerous, no inquiries are instituted. Even when death takes place there is a general disposition to exonerate the chemist from blame, as will be perceived by two of the following cases.

The first occurred recently. An infant died from the effects of a dose of laudanum administered by its mother in mistake for tincture of rhubarb. A servant lad was sent with a written message for threepennyworth of tincture of rhubarb to the shop of a druggist in a country town. The proprietor himself measured out the liquid, and gave it to the lad. Half a teaspoonful administered by the mother killed the child in a few hours, with the usual symptoms of poisoning by opium. On examining the liquid remaining in the bottle it was found to consist of pure laudanum. The verdict was to the effect that death had resulted from a dose of laudanum given by mistake.

This case occurred at Wigan in January of the current year, and I am indebted to Mr. Grimshawe, the coroner, for a full account of the particulars.* The mistake appeared to have arisen from carelessness on the part of the druggist, and not from ignorance, and it presents a characteristic feature of all such fatal errors in dispensing or vending medicines, namely, the positive denial, as a rule, that any mistake has been made. The druggist made the following statement at the inquest: "The boy came to the shop, and asked for threepennyworth of tincture "of rhubarb, and I gave him what I thought was the tincture of "rhubarb, and I think so still, for I do not believe I gave him laudanum "at all. I have no reason to think I gave laudanum, and nothing has "occurred to my mind to lead me to think so." A *juror* asked, "Is the tincture of rhubarb bottle kept near that containing lauda-"num?" *Druggist.* "They are near together; one or two off each "other. One bottle is a little larger than the other." The bottle and its contents were clearly traced to the druggist's shop. A medical man, called in to see the child, found it dying under the symptoms usually caused by laudanum, and on asking to see the bottle from which the dose of medicine had been given, he found in it nothing but laudanum. This strong denial of a mistake from inattention or carelessness, in face of facts which prove that a mistake must have been made, has in more than one instance led to unfounded charges of murder against innocent persons who have had the care of children. The jury exonerated the druggist, attributing the result to accident, and not to gross carelessness. They suggested, however, that bottles containing poisonous medicines or drugs should be distinctly labelled, and not kept on the same shelves close to others which were not poisonous.

A servant was sent to a village shop for an ounce of powdered rhubarb. The person to whom she applied is described as grocer, draper, and druggist to the village. The grocer weighed from a small bottle half an ounce of a powder which he said was all that he had of that kind. The girl remarked that the powder was very dark in colour, which the grocer admitted, but made no further observation. A teaspoonful of this powder with a few drops of laudanum was given to a young woman for whom the rhubarb had been prescribed. In a short time she was seized with symptoms of poisoning by opium, and died the same evening. The powder purchased as rhubarb, was found to be powdered opium, without any admixture, and eight or ten grains of

* See Report in Wigan Examiner, Jan. 8, 1864.

opium in powder were found in the stomach of deceased on a post mortem examination of the body.

The statement made at the coroner's inquest by the person who was guilty of this serious mistake shows the great danger to which the lives of the public are exposed by allowing ignorant and incompetent persons to sell powerful medicines capable of acting as poisons. This event occurred on the 29th April, and the draper-druggist, when called before the coroner's jury, stated "that he took his shop on the 9th of "April, with the stock of groceries, draperies, and drugs, including "the powdered opium; that he understood from the outgoing tenant "that the powder was rhubarb, and he himself supposed so from "seeing the word "Turc" on the label. He had not a thorough "acquaintance with drugs, and sold the powdered opium ignorantly." The jury found that he had been guilty of culpable negligence and ignorance, and returned a verdict of manslaughter against him.*

This case furnishes an instance of the incompetence of village shopkeepers to deal in poisons. The bottle which contained the powdered opium was thus labelled, "Pulv. Opii, Turc. Opt." Because rhubarb also comes from Turkey, and is sometimes labelled "Pulv. Rhei, Turc. Opt.," the draper had fixed upon the word "Turc" as indicative of rhubarb powder only. If, as he stated at the inquest, his predecessor in the business handed over to him the contents of this bottle as rhubarb, it is not improbable, as rhubarb is a popular medicine for children, that some may have previously died from this complete ignorance of the nature of drugs. The two powders may be easily distinguished by smell and colour, by any one having the slightest acquaintance with drugs.

Another case which occurred in the country furnishes an illustration of carelessness in a druggist and incompetence in a shopkeeper. A mother wishing to give a dose of tincture of rhubarb to her child applied for this medicine at a small village shop kept by a woman who dealt in apples, sweetmeats, spirits of nitre, tincture of rhubarb, castor oil, &c. It does not appear that laudanum was among the articles which she professed to sell. After two doses of the medicine had been given to it, the child was seized with the usual symptoms of poisoning by opium, and died in the course of a few hours. The liquid sold at the village shop as tincture of rhubarb was found to be tincture of opium; and it then transpired that the shopkeeper had procured it of a regular druggist in a neighbouring town. It had been sold by an apprentice to this druggist as tincture of rhubarb. The coroner's jury found that the deceased had been accidentally poisoned by an overdose of laudanum; and the apprentice who had made the mistake was discharged with a caution.†

It would be easy to accumulate instances of this kind, but those above mentioned may suffice to show that by ignorant, incompetent, or careless persons, life is frequently endangered by reason of opium in tincture or powder being mistaken for rhubarb.

Antimonial wine is occasionally employed by the poorer classes as a medicine for children. In the following case, colchicum wine, a powerful poison, was supplied by mistake for the medicine. A mother was advised to give to her child, suffering from diarrhœa, a dose of antimonial wine. She applied for it at a regular druggist's shop, and she was served by a youth, 16 years of age, who was not acquainted

* See Pharmaceutical Journal and Transactions, June 1858, p. 627.

† See Pharmaceutical Journal and Transactions, April 1859, p. 528. Other cases, similar in their details, are reported in the same journal for September 1856, p. 195, and October 1863, p. 186.

with the nature of drugs. Several doses of the wine were given to the child, which led to its death on the following day, and the liquid remaining in the bottle was found to be wine of colchicum, which had been sold by mistake. The coroner's jury dismissed the druggist with a reprimand.*

The sale of oxalic acid, nitre, and other saline compounds of a noxious kind, for Epsom salts has been a frequent cause of death. The facts of the subjoined case, which occurred in December 1863, at Oswestry, were communicated to me by the medical gentleman who was called to see the deceased:—

The deceased applied to a druggist for some Epsom salts. He was served with eight packets. One of them, equivalent to an ounce in weight, he mixed in water, and swallowed about nine o'clock in the morning. He died under symptoms of irritant poisoning in less than three hours. The packets were labelled "Purified Epsom salts;" but when examined they were found to contain nitrate of potash in powder. The nitre had caused death, with the usual symptoms of irritant poisoning. It was admitted at the inquest that the powdered nitre and Epsom salts were kept in drawers close to each other, and thus the mistake had arisen. The boy who made the mistake was 17 years of age. The verdict was to the effect that the man had been poisoned by nitre; but the druggist, whose business was thus carelessly conducted, was exonerated from all blame.

A man went into a druggist's shop in London to purchase two ounces of Epsom salts. Hearing they had a taste, he asked the apprentice who supplied him to exchange them for tasteless salts (Rochelle salt). An exchange was made, and the man swallowed an ounce of the substance which had been given to him. He was seized with symptoms of irritant poisoning, and died after nine days, suffering in the meantime from inflammation of the stomach and bowels. It was found that the apprentice had supplied him with tartaric acid in place of the tartrate of potash and soda. The druggist, who admitted the mistake, was subsequently tried on a charge of manslaughter. It was contended in the defence, that the drug had been supplied in error and by mistake, and not with that gross and culpable negligence which would constitute the crime of manslaughter. The jury acquitted him.†

Several cases have come to my knowledge in which oxalic acid has been retailed in place of Epsom salts. In one of them, which occurred in London some years since, a man was sent to the shop of a respectable druggist for four ounce-packets of Epsom salts. He was served with four packets, labelled as usual "Purified Epsom salts." In the evening, the gentleman who had sent for the salts, took the contents of one of these packets; he was seized with the usual symptoms of poisoning by oxalic acid, and died in a few hours. I examined the contents of the stomach, and found oxalic acid therein, and I also found that the three unopened packets contained oxalic acid, labelled as above described.

In another instance in which I was consulted, a gentleman on a visit to London entered the shop of a respectable druggist, and asked for an ounce and a half of Dinneford's fluid magnesia. The druggist poured a liquid from a bottle into a glass, but when the applicant took a portion of it into his mouth, he found that it was some caustic burning fluid. On looking at the bottle, he saw that it was labelled "Burnett's

* Pharmaceutical Journal and Transactions, February 1859, p. 438.

† The case of the Queen against Watkins, Central Criminal Court, January 1845. See also Pharmaceutical Journal and Transactions, February 1845, p. 370.

Disinfecting Fluid." He subsequently suffered from severe pain and vomiting; and medical men who saw him stated that his symptoms were such as Burnett's fluid (chloride of zinc) would produce. He recovered after nine days, and brought an action against the druggist, in consequence of his having negligently given him an irritant poison in place of medicine. The defendant denied having given him Burnett's fluid, which he did not keep, although he kept chloride of zinc in his shop, and said that he had poured out a solution of Epsom salts. This would not, however, have accounted for the symptoms from which the plaintiff had suffered. A verdict, with 75*l.* damages, was returned against the druggist.* Owing to similar mistakes, and chiefly owing to fluid magnesia and disinfecting fluid being sold in similar bottles with somewhat similar labels, several lives have been destroyed.

In a case in which I was consulted, and which led to a trial for murder at the Central Criminal Court, it was proved that powdered white arsenic was kept on a shelf near to bottles containing calomel and sugar, and other white powders resembling arsenic. A dose of four grains of calomel was prescribed for an infant late at night. Arsenic was supplied in place of calomel. The child died, and on examining the stomach, arsenic in powder, in quantity nearly corresponding to the above dose, was found in that organ, but no calomel. The child was dying from intussusception when the supposed calomel was given; but the discovery of arsenic in the stomach, led to a charge of murder against the mother and grandmother who had had the care of the child, and had given to it its food and medicine during its illness. On proof of the facts above mentioned, *i.e.*, that arsenic and calomel were kept on contiguous shelves in the same shop, and that no calomel was found in the body, and no motive for poisoning could be suggested, the learned judge stopped the case, and the jury acquitted the accused of the charge.†

The dispenser who compounded the medicines in this shop, strongly denied that any mistake had been made. The following is an extract from his evidence:—

"The powder was white. I know that white arsenic was kept in the shop, but I did not sell any arsenic that night. *By the Court.*—I should not know calomel from arsenic by its appearance. I don't know whether arsenic is rougher in appearance than calomel. I never examined them together. I cannot say whether calomel being mixed with sugar would give it still more the appearance of arsenic. *Mr. Clarkson* remarked that he thought it was fortunate for the public that this gentleman (the witness) had not succeeded to the retail drug business of his uncle."

The late Dr. Snow communicated to me the following case:—The parents of a child sent to the shop of a provincial druggist for a pennyworth of magnesia. It happened that the druggist was not in the shop at the time, and his assistant, a youth, dispensed arsenic by mistake for magnesia. The poison was given to the child; the usual symptoms followed, and the child died.

A superintendent of police, in endeavouring to trace out the sale of poison in reference to a case of alleged murder, informed me that on entering the shop of a provincial druggist on a market day he saw on the counter a bottle of white arsenic in powder near several other

* Richards *v.* Cocking, Guildhall, July 1858. See Pharmaceutical Journal and Transactions, August 1858, p. 139.

† The Queen against Dore and Spry, Central Criminal Court, August 1848. See also London Medical Gazette, Vol. 42, 1848, p. 888.

APPENDIX. bottles containing white powders, which he was informed were of a medicinal nature.

No. 16. *Dangers in the Sale of Drugs and Poisons, by Dr. A. Taylor, F.R.S.*

Most of the cases above mentioned may be traced partly to carelessness, and partly to incompetence and gross ignorance, on the part of those who are allowed to retail drugs to the public. The injurious effects of such incompetence and ignorance on the health of the public, and the great danger to life, are increased a hundred-fold by reason of the carelessness displayed in keeping innocent medicines and poisonous compounds resembling each other on shelves or drawers in close proximity. The plea for this practice is that laudanum is a drug as much or even more in request than tincture of rhubarb or senna, and it requires to be as much within the reach of the vendor. The bottles are commonly of the same size and shape, with similar labels; and the system of labelling usually adopted, namely, the use of abbreviated Latin words, is no doubt a fertile source of mistakes. Three bottles of similar shape may be thus labelled,—TINCT. OPII (Laudanum), TINCT. RHEI, TINCT. SENNÆ. Each label, as I have had occasion to notice, commences with a similar abbreviation, and a bottle containing laudanum (Tinct. Opii), turned a little on one side, as the liquids have a similar colour, may easily be mistaken for one of the other two. The bottles may sometimes be misplaced, and thus without looking at the label, but deceived by the position of the bottle, the poison may be dispensed for the medicine.

Among those ignorant persons who keep village general shops for draperies and groceries, and who deal in certain drugs and poisons, the mistakes are not only more frequent but more serious in their consequences to health and life. It would be difficult to define to what extent the public health suffers in this respect; for symptoms of poisoning are so apt to be mistaken for bowel complaints, fits, or convulsions, especially when death is not the immediate result, or a person has been for some time ill, that such cases are generally set down to disease, and the deaths are registered accordingly. A closer scrutiny would probably show that poison carelessly sold, in a state of mixture with common articles of food, or a poison sold for medicine, may have been the real cause. Even in the event of death taking place, as no suspicion exists among the neighbours, and post-mortem examinations and analyses are not made, except when strong suspicion has been excited by moral circumstances, such cases are necessarily overlooked.

Among various instances of the sale of poisoned food that have come before me during the last 30 years, illustrative of the effects of carelessness and ignorance combined, are the following:—

A man died from the effects of some oatmeal purchased at a village general shop, where drugs and poisons, including arsenic, were sold. The death of this man from arsenic led to a suspicion that a murder had been perpetrated by some member of his family. Some oatmeal procured at the same shop was found to contain arsenic in quantity sufficient to destroy life. The meal was kept in a large drawer, divided into a number of parts by loosely fitting wooden partitions. In one of them white arsenic in powder had been kept, and the poison had diffused itself through the contents of the different divisions of the drawer, thus giving to all of them, more or less, poisonous properties. Several articles of food in common demand were found to have been accidentally poisoned. How many persons had suffered in health from this carelessness in keeping arsenic, before attention was drawn to the fact by the occurrence of a sudden death from poison, it is now impossible to state.

Another instance occurred recently in one of the northern counties, which brought to light two cases of death from the criminal administration of arsenic one and nearly two years previously. A man in a respectable position of life as a small farmer kept a village general shop, where rice, arrow root, sago, and other articles of food were sold. He also kept arsenic for sale. Some ground rice was purchased at this shop by a neighbour, and seven or eight persons were made seriously ill and nearly killed, in consequence of eating a pudding made with a portion of this rice. An action for damages was brought in the county court against the shopkeeper, but this was decided in his favour, on the ground that the arsenic might have got into the rice by accident. It transpired, however, that other persons had suffered from symptoms of poisoning by reason of their partaking of food from this shop, and it was then remembered that the wife of the shopkeeper had died suddenly 21 months before, and his mother had also died a year before this date. Their bodies were exhumed, and it was found that they had both died from the effects of arsenic. This led to the trial of the shopkeeper and a woman whom he had married after the death of his wife, for murder. It came out in evidence that arsenic was so carelessly kept in the shop that it might have become mixed with various articles of food (arrow root) given to the wife and the mother during their illness, and thus have accidentally caused the deaths of both. The jury returned a verdict of manslaughter, and the prisoners were sentenced to penal servitude for life. But for the simultaneous illness of so many members of a family who had partaken of food procured at this village shop, their violent deaths by poison would probably have remained unknown to this day.*

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* The Queen against Garner and Wife, Lincoln Lent Assizes, 1863. It is worthy of remark, that an inquest was held on the body of the wife immediately after her death in March 1861, and the jury returned a verdict to the effect "that deceased "died suddenly from natural causes by visitation of God, and not from any violent "cause." When the present experienced coroner for Boston, Mr. Walter Clegg, heard of the sale of this poisoned rice, &c., he, upon his own responsibility, ordered the exhumation of the bodies of the wife and mother of the male prisoner. The result of the inquiry showed that he had taken a correct view of the facts. The medical gentleman who attended the wife in her illness, candidly admitted that at the time he had no suspicion that poison was the cause of the symptoms.

I am indebted to Mr. Justice Willes for a note on a similar case. A woman named Alice Hewitt was tried before him at Chester Winter Assizes, December 1863, and convicted of poisoning her mother with arsenic in the month of March preceding. Although the symptoms of irritant poisoning were very clearly marked, a medical man who attended her, certified the cause of death as gastro-enteritis. Eleven weeks after the burial of the deceased, the body was exhumed and examined, when as much as 154 grains of arsenic were found in the stomach and contents. It was proved that shortly before her mother's death, the prisoner had purchased a quarter of a pound of arsenic for threepence, and had insured her mother's life in one of the local clubs, by causing a woman to personate her. This murder by arsenic, as well as the two mentioned in the text, are necessarily entered in the returns of the Registrar General as deaths from natural causes.

When causes of death are certified as cholera, choleraic or bilious diarrhœa, gastro-enteritis, convulsions, &c., without any inspection of the body, the fact that there may have been really symptoms of poisoning, is altogether overlooked. At the trial of Catherine Wilson for murder at the Central Criminal Court in September 1862, I declined to accept a certified cause of death from disease, as a proof of the real cause, believing it, as it was proved to be by the conviction and execution of the prisoner, a death from poison overlooked in its true features at the time of its occurrence. I then stated that on eight different occasions I had given evidence at inquests or on trials for murder by poison, in which death had been certified from natural causes; and on exhumation of the bodies, many months afterwards, poison was found in them, and this had really been the cause of death. That statement was at the time received with something like incredulity on the part of the counsel for

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The superintendent of police, who gave evidence at the trial, made the following statement respecting the discovery of arsenic in the shop: "I went into the shop, and saw Whittaker and Garner (the two prisoners), and the former pointed out the place where the arsenic was kept. It was placed upon a shelf under the counter. There would be half a hundredweight at least, in pound and half pound packages. I saw a pound packet of white arsenic which had been broken into; it was three and a half ounces deficient. It had evidently been recently broken open, but neither Garner nor Whittaker could account for it. Both asserted it had been recently opened. The string was cut, and not to be found. They complained that the parcel had been opened by some one who had no business to open it. There was another parcel, which had been open some time, as it was very dirty, and both stated that this package only should have been broken into. It contained white arsenic."

In reference to this discovery of the mode in which arsenic in large quantities was kept in a village shop, it may be stated that during the illness of the prisoner's wife in March 1861 she was attended by a woman who gave her arrow root and milk, the former being procured from the shop. The woman used occasionally to taste the arrow root, and she suffered like the wife from sickness and purging. The wife died, as it was afterwards proved, from the effects of arsenic; and the nurse suffered from paralysis, as a result of the action of arsenic, and was for a period of 10 weeks an in-patient at an hospital. Nearly two years after the death of the wife and the illness of the nurse, the police took from the prisoner's shop a large drawer, labelled in ink-writing on paper, "Arrowroot and Baking Powder. *2d.* per oz. *2s.* per lb." This was submitted to me for analysis. The drawer contained a pound and a quarter of a starchy powder, having the appearance of common arrowroot. On analysis, it was found that this arrowroot was mixed with about 140 grains of arsenic. All parts of it were more or less poisoned, and a tablespoonful, weighing 550 grains, yielded nine grains of white arsenic. There was no baking powder in the drawer. The drawer had no cover, and was one of many opening as usual from the counter, without anything to indicate the deadly nature of its contents. Any person applying for arrowroot or baking powder might have been served from this drawer. There was no evidence how, when, or by whom the poison was mixed with the arrowroot.

The death of the Rev. Dr. Alexander, in April 1857, shows that no class of society is safe against mistakes of this nature. On the 16th March a servant was sent to the shop of a grocer in Ferbane, for one pound of arrowroot. The shopman, not having so much in the bottle which he placed on the counter, took from a paper parcel a sufficient quantity of a white powder to make up the proper weight. Arrowroot was prepared with it in the usual way, and Dr. Alexander, his daughter, and two of his servants partook of it. They all suffered from symptoms of poisoning by arsenic, and Dr. Alexander died from the effects of the poison on the sixteenth day. The white powder which the shopman had employed to make up the deficient weight, was proved to be white arsenic. Dr. Alexander's steward, who went to the shop after the accident to make inquiries, found rice, corrosive sublimate, jalap, and

the prisoner. Since that trial I find, on reference to my notes, that I have examined sixteen exhumed bodies, where death had taken place from poison, and natural causes had been certified. This number is exclusive of three exhumations of the victims of Catherine Wilson. Here natural causes had been certified, although, as the learned Judge, Mr. Justice Byles, remarked, the deceased persons had been destroyed by poison.

oxalic acid(in different papers in the same drawer, and all under the care of an ignorant boy.*

In reference to the cases of illness and the number of deaths caused annually in this country by carelessness in retailing drugs or poisons for medicines, it would not be possible to give an opinion without a correct return of inquests held by coroners, and a reference to the books of medical practitioners. The cases which are accidentally brought to light, render it probable that many escape notice altogether. With regard to the number of persons who are injured in health, but recover from the effects of such carelessness, they can be known only to the medical men who attend her. Instance may be required. They seldom come before the public, but are occasionally reported in the medical journals. The deaths of children from opiates are very numerous; but here, probably, the greater number are to be attributed as much to carelessness in those who administer, as in those who retail the various opiate preparations commonly given to children.

Cases have come to my knowledge in which strychnia has been dispensed by mistake for salicine, morphia, and jalapine, and has caused death. This has arisen, not so much from incompetence on the part of the dispenser, as from *carelessness* in keeping drugs of a similar appearance (some highly poisonous and others not) contiguous to each other, in similar bottles, indistinctly labelled. In such cases, death is likely to be assigned to natural disease, the dispenser not being aware of his error, and no inquiry made; and the medical man probably finding a sufficient cause for the symptoms by reference to exposure to cold or wet, or to the effects of disease.

The extent of injury to the public cannot, however, be measured by the number of deaths, even if recognized and accurately recorded. In numerous cases the effect of noxious drugs dispensed for medicines is to undermine health, and to cause injury which may affect a person for life.

There is also another source of mischief which may arise from these mistakes. As a dispenser, acting *bonâ fide*, is never aware when a mistake has been made, and almost always denies it in the strongest language, it follows that those who may have given food and medicine to the deceased, and who have been in attendance upon him up to the last hour, are exposed to a false accusation of administering poison. If poison is found in the body or in the medicine, this is considered to be of itself a sufficient proof of the charge, and even the absence of motive or moral circumstances will not always suffice to show that the charge is groundless. The proof of the mistake, if denied, will in general rest upon presumptions. A false charge of murder, arising out of careless dispensing, is easy to be made, and hard to be disproved, as there can rarely be immediate access to the bottles or drawers of a shop to establish the fact upon undeniable evidence. One case has been referred to in this report (page 747) which impressed the late Baron Platt, who tried it, with the great uncertainty of evidence in such cases, up to the last hour of his life. Many years after the trial, in discussing the case with me, he referred to the details of evidence, as showing how such a mistake by a dispenser, with his absolute denial of it on oath, might have led to the conviction and execution of two innocent persons.

* See Medical Times and Gazette, April 18, 1857, p. 38.

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II.—TO WHAT EXTENT ARE UNNECESSARY FACILITIES GIVEN FOR THE PURCHASE OF POISON FOR CRIMINAL PURPOSES.

There is no legal restriction on the sale of any poison excepting *arsenic*; but the statute for regulating the sale of this poison is a dead letter, so far as the public safety is concerned. According to the provisions of the statute (14th Victoria, cap. 13. sect. 3.), no person is allowed to sell arsenic in smaller quantities than of ten pounds weight, unless it is previously coloured with a certain proportion of soot or indigo; but in several cases of criminal poisoning (two occurring in 1863), which I have been required to investigate, involving charges of murder, uncoloured or white arsenic has been used as the instrument of death. Its great cheapness (one penny to twopence an ounce), places it within the reach of the poorest person. It is sold to any applicant on the most frivolous pretences; and even in the coloured state, it affords but little protection, except when it is mixed with liquids. The better class of druggists do not sell arsenic by retail; the grocer, chandler, oilman, and village shopkeeper, are the principal vendors of this poison; and it is clear from the numerous deaths which take place from white arsenic, that they set the law at defiance, and sell the poison in an uncoloured state, in which case it may be readily administered in any article of food, without exciting suspicion.

Nux vomica in powder is also easily procurable, under the usual pretext, that it is intended for the destruction of vermin. In one instance of attempted murder which I was required to investigate, a mere youth had been able to procure a quantity of this poison, and had attempted to destroy the life of his mistress, by mixing it with milk prepared for her breakfast.

Strychnia, morphia, veratria, prussic acid, the oil of bitter almonds, and preparations of colchicum, are not commonly found in the shops of the lower class of druggists or village shopkeepers, and they are not retailed to strangers, without due inquiry, by the respectable class of druggists who keep them; but there is no impediment to their sale except that which may arise from conscientious feelings on the part of the vendor, or from his suspicions being aroused by the statements of the person who asks for such potent drugs. If the applicant is prepared to pay for them, and to assign a plausible reason for the purchase, he will find no great difficulty in procuring them. In one instance, an ounce of wine of colchicum was supplied to a maid servant by a druggist, and it was employed for a criminal purpose. The servant had been directed to state that the wine was required as drops for the treatment of rheumatic gout. It was used as a poison, and destroyed life.

There are unnecessary facilities given for the purchase of a variety of noxious drugs, such as oil of savin, cantharides, tincture of ergot of rye, and tincture of the perchloride of iron, which are employed for the purposes of criminal abortion. Corrosive sublimate, the sulphates of copper, iron, and zinc, and other mineral irritants, are easily procured upon false pretences, and are then employed to procure abortion. These drugs, thus used by ignorant persons, either lead to the destruction of life, or seriously injure health. In one instance within my knowledge, arsenic was purchased and given as an abortive: it destroyed the life of the woman, without causing abortion; in another instance, which was the subject of a recent trial, the health of the female was completely broken up by the effects of large doses of tincture of perchloride of iron. The tincture had been procured

by a farm labourer, without any difficulty, at the shop of a man who had been regarded as a respectable druggist. It was clearly proved that he was cognizant of the purpose for which this drug was required, and he was convicted.*

There are two poisons of a most potent kind which can be readily purchased even by boys and girls, either at the village shop or at the druggists. These are *strychnia*, sold under the name of Butler's vermin killer or Battle's vermin killer, and *cyanide of potassium*. The first is professedly sold for destroying vermin; but it has been the means of death in many cases of murder and suicide, some of which have come under my notice. These two popular vermin killers are mixtures of strychnia with flour or farinaceous meal, coloured either with soot or Prussian blue. A threepenny packet contains, according to my analysis, one grain of strychnia, and a sixpenny packet two grains. In the threepenny packet there is sufficient poison to destroy the lives of two persons. The following recent case, in which I was required to give evidence, may be taken as an illustration of the dangerous facilities which exist for the sale of this deadly poison. A girl, aged only 13 years, was tried for the murder of her master's infant, whom she had been employed to nurse. It seems that the child was restless, and gave the girl some trouble. The girl went to a village grocer's shop, and procured, without any difficulty, a packet of Battle's vermin-killer. She took the opportunity of her mistress's absence from the room, to put a small portion of the powder into the infant's mouth. It died in a few hours with the usual symptoms of poisoning by strychnia. It turned out upon inquiry that this child had acted as nurse to infants in other families; and on two previous occasions, the infants intrusted to her care had also died suddenly in convulsions, as it is believed from the administration of this deadly poison! She was found guilty of manslaughter, and sentenced to penal servitude.†

So long as such facilities are given for the purchase of strychnia at a cheap rate, in village grocers' shops, by mere children, so long will it be useless to place restrictions on the sale of other and less potent drugs. Respectable druggists refuse to sell these powders, or strychnia in any form, but the sale of them has become a profitable branch of trade in the shops of oilmen, grocers, and others. As strychnia can be purchased for less than a penny per grain, the profit on the sale of these dangerous powders cannot be less than 200 per cent.

The *cyanide of potassium* is another deadly poison, which is fatal to life in small doses, and from its great solubility in liquids it admits of being easily administered in a poisonous dose. It is largely used in photography, and under the pretence that it is required for this purpose, it may be easily procured at a cheap rate in large quantities from dealers in photographic chemicals, and from druggists generally. It is not used in medicine, but is much employed in the arts, and has caused death in numerous instances.

The trade in poisons in this country, may be considered to be as open and free as it possibly can be. I doubt whether by any act of Parliament, greater facilities for the purchase of poison for criminal purposes could be given. No one wishing to destroy another by poison and having the knowledge to make a selection among drugs, can meet with any difficulty in carrying out his design. If refused at one shop, he can procure the poison at another. If refused by a druggist, he can

* Regina v. Rumble. Lincoln Lent Assizes, 1863.

† The Queen against Elizabeth Vamplew, Lincoln Summer Assizes, 1862.

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procure it at a grocer's. If refused at a grocer's, he can procure it at a village general shop, where poisons are retailed by girls and boys, and no questions are asked. So long as a person of any age has the command of threepence, he can procure for this sum, a sufficient quantity of one of the most deadly poisons to destroy the lives of two adults. There is surely here great and unnecessary facility given for destroying human life, under the pretence that the poison is intended for the destruction of vermin.

In the course of more than 30 years' experience in investigating charges of poisoning, I have met with a large number of cases in which murder and suicide have been perpetrated or attempted, as a result of the dangerous facilities which exist for the purchase of poisons.

I believe that respectable druggists in town and country throw every impediment in the way of the purchase of poison. Some poisons would not be sold to strangers under any circumstances; others of a quasi-medicinal character, would be sold only under the prescription of a medical man, or upon the written order of some medical practitioner known to the druggist. They will also question the person who proposes to purchase a poisonous drug, respecting the intended use of it; and if his answers are not quite satisfactory, they properly refuse to serve him. A leading chemist of London who deals in poisons of a deadly kind, informed me that about the time of the trial of William Palmer, when the public mind was so much excited on the subject of secret poisoning, a respectable person entered his shop, and required him to make up a grain of aconitina, the alkaloid of monkshood, into 10 pills, representing that they were required for medicinal use. The druggist, knowing the properties of the alkaloid, refused to serve him, and informed him that if he had any knowledge of the drug, each pill would form a dangerous, if not a fatal dose. Admitting that public safety is thus in some cases well looked after by respectable druggists, it must be borne in mind that they form only a small proportion of those who are allowed to retail poisons; and that after all, health and the security of life are to a certain extent left to their discretion. The lower class of drug dealers, including grocers, oilmen, and the general shopkeepers of villages, have no such scruples; and although, if we except strychnia, many of the more potent poisons are not found in their shops, they have still a sufficient number of noxious drugs to endanger health and life, by reason of the facility with which they dispose of them to the public.

The careless custody of poisons is a fertile source of danger to the public. They are either not labelled or so imperfectly, that they are liable to be used on a large scale by mistake for other substances which they resemble. Orpiment may be sold by mistake for chromate of lead, turmeric, or mustard. In a set of cases which occurred in June 1862, about 40 members of a volunteer corps suffered from symptoms of arsenical poisoning in consequence of having eaten cheese which was found to contain arsenic. The poison had probably been ignorantly used in the state of orpiment for colouring the cheese. In December 1859 six persons suffered severely from the usual symptoms of poisoning by arsenic, owing to their having eaten some Bath buns purchased of a confectioner at Clifton near Bristol. The confectioner wishing to improve the appearance of his buns by giving to them a rich yellow colour, sent for some chronte yellow (chromate of lead, which is itself a poison), and mixed what he supposed was the chrome yellow with the dough. The druggist to whom he applied, ignorantly supplied him with orpiment or sulphide of arsenic, and this mistake gave rise to a degree of illness the real extent of which could not be ascertained.

An analysis of the buns proved that sulphide of arsenic or orpiment was the yellow colouring ingredient.

In November 1858 a confectioner at Bradford wishing to adulterate his peppermint lozenges with some cheap white material in order to save the cost of white sugar, sent a boy to a druggist for 12 pounds of "daff" (plaster of Paris or sulphate of lime). The druggist, being at the time ill, directed his shopboy, a lad 18 years of age, and who had been only three weeks in the business, to procure the "daff" from an attic in which it was kept with other chemicals. The boy was simply told that the "daff" was in a cask in the corner of the attic. He found a cask containing something white, which he concluded to be the article required. He weighed out *twelve pounds* of what he thought was plaster of Paris, but which was subsequently proved to be *white arsenic*. The confectioner mixed this large quantity of poison with four pounds of gum and water, forty pounds of sugar, and an ounce and a half of peppermint. The whole was made into lozenges, and delivered to a dealer in four parcels for sale in the open market on a Saturday. The man who made the lozenges, suffered severely from sickness from one o'clock until nine at night, without any suspicion of the cause. Large quantities of the lozenges were sold at the remarkably low price of two ounces for three halfpence, the admixture with the supposed plaster of Paris enabling the dealer to sell them at a great profit at this price. Many persons purchased two ounces, this quantity containing about half an ounce of *arsenic*. Some of the lozenges were subsequently found on analysis to contain nine grains and a half of the poison; others from 11 to 16 grains. On an average each lozenge contained one third of its weight of arsenic.

Some children who had partaken of the poisoned lozenges died on the evening of the day on which they had purchased them, and it was at first supposed that they had died from a severe attack of cholera. On the following day other persons were attacked with similar symptoms, and it was then found that all who had thus suffered, had partaken of lozenges purchased of the same dealer in the market on Saturday. It was difficult to determine the exact amount of illness and mortality caused by this serious mistake; but I have been informed on good authority that more than 200 persons who had eaten the lozenges suffered from the usual symptoms of poisoning by arsenic, many of them in so severe a form that 17 died, 12 from acute poisoning and five from the secondary or chronic effects of arsenic. Many were for a long time ill.*

The druggist who sold the arsenic by mistake for plaster of Paris was tried at the York winter assizes in 1859 on a charge of manslaughter, and acquitted by the direction of the judge, the late Baron Watson. He directed the jury that there had been no negligence in the case, to make the prisoner or any one legally responsible for the deaths of those who had eaten the lozenges. *Criminal* negligence must be proved in order to convict a person of manslaughter under such circumstances.

The facts in reference to the custody of the arsenic were these: a Police inspector visited the attic or loft where the drugs were kept, and he found a cask containing two hundredweight (224 pounds) of arsenic, two or three yards from the corner of the room. There was no label on it; but it was subsequently found that the cask was resting on the labelled end, and was too heavy to be turned over,

* See Pharmaceutical Journal and Transactions, December 1858, pp. 227, 340, and January 1859, p. 390.

hence it was not visibly labelled. In the same room, but in a corner, was the "daff" or plaster of Paris in a *similar cask*. A boy of only three weeks' experience in a druggist's shop, was thus sent with verbal directions to procure plaster of Paris in a loft in which a large quantity of arsenic was kept in a similar cask, and without any visible label. He was not required to bring the sample to his master to let him see that no mistake had been made, but to make the best selection that he could from a three weeks' experience in drugs. The loss of *seventeen lives* and the serious illness of *one hundred and eighty-three persons* were the results of this mistake, and no negligence could be legally established against anyone! The learned judge remarked that "he did "not know that a man could do more (than the druggist had done), "except not keep arsenic."

The case, however, conveys this warning if we desire to prevent the wholesale destruction of life. If arsenic and plaster of Paris, which present a somewhat *similar* appearance in powder, are kept in similar casks in the same loft, they should be at least plainly and distinctly labelled, so that no mistake could be made by even an experienced man. If, however, the poison and the innocent substance are kept in the same place in similar casks unlabelled, a youth of three weeks' experience in drugs, who admitted that he could not distinguish arsenic from plaster of Paris, was not a proper person to send, to make the selection upon a conjecture. Had the cask of arsenic been labelled, as it should have been, in a visible and conspicuous manner, this great destruction of life and injury to health would not have occurred. It will be seen that the evil of adulteration in selling plaster of Paris for white sugar was the main cause of this wholesale slaughter.

A large number of cases of poisoning by *sugar of lead* occurred at Stourbridge some years since. By some negligence or carelessness, about *thirty pounds* of sugar of lead in powder were mixed at a miller's with 80 sacks of flour, and the whole was made into bread by the bakers, and supplied as usual to their daily customers. According to the report of Mr. Bancks, no fewer than *five hundred persons* were attacked with symptoms of lead poisoning, after partaking of this bread. In a few days they suffered from a sense of constriction in the throat, pain at the pit of the stomach, violent cramps, dragging pains in the loins, and paralysis of the legs. There was obstinate constipation; the pulse was generally slow and feeble; the countenance anxious and sunken; frequently of a peculiar livid hue. Other symptoms characteristic of lead-poisoning were present. It is remarkable that not one of the cases proved fatal; for among the more severe there was great prostration, with collapse, lividity of the face, universal cramps, and other alarming symptoms. After apparent recovery, some of the symptoms returned in a more aggravated form without any obvious cause, and for a long time the patients were out of health. The quantity of sugar of lead taken by each person could not be determined, as on analysis the samples of bread were found to be very unequally impregnated with the poison.*

The following is an additional illustration of the danger to health and life which may occur from the reckless use of poison under circumstances in which such use would not be suspected. In December 1857 I was consulted on the chemical nature of a liquid which had caused symptoms of poisoning among the children at a large industrial school at Norwood. Soon after their usual breakfast on bread and

* See Report by Mr. Bancks, Lancet, May 5, 1849, p. 478.

milk, *three hundred and forty children* had been suddenly seized with violent vomiting, purging, and other symptoms of irritant poisoning. The only cause to which the illness could be assigned was a green coloured liquid, some of which had been put into the steam boiler on the previous night, for the purpose of cleansing it of fur. A portion of this water had been drawn off in the morning, in order to mix it with the milk for the children's breakfast. An analysis of the liquid speedily showed that it consisted of a strong alkali holding dissolved a large quantity of arsenic: it consisted of arsenite of soda in its most concentrated form. Remedies were suggested accordingly, and all the children were placed under active treatment, which was so effectual that not one death took place. The history which I obtained of this wholesale poisoning was as follows:—The engineers who had fitted up the steam boiler had directed one of their workmen to employ two gallons of this cleansing liquid, of the poisonous nature of which no information was given to any one in the establishment,—to remove the calcareous deposit in the boiler. This quantity, containing, as I found by analysis, about *nine pounds of arsenic*, was well mixed with the water in the steam boiler. Fortunately only four gallons of the poisoned water were drawn from the boiler on the following morning. It was mixed with thirty gallons of milk, and divided among 340 children, about a gallon of the mixture being shared by ten children. Upon an average each child took a *grain of arsenic*, more or less. The symptoms from which these unfortunate children suffered were severe pain, vomiting, purging, shivering, and discharge of mucous fluid from the nose. Seven had cough of a croupy character, three vomited blood, and one passed blood from the bowels. Some suffered from inflammation of the stomach; of these, six only were under treatment at the end of the first week, and one did not recover until after the second week. The escape of these children may be attributed to the great dilution of the arsenic in the water of the boiler, its still further dilution by the large proportion of milk with which it was mixed, and the early and active treatment to which they wer subjected.

As there was no loss of life, no legal question arose here in reference to simple, gross, or criminal negligence. No proceedings could be taken against the parties under the Arsenic Act, because the poison had not been *sold*. The great danger to life, however, was unquestionable; and had the workmen put eight gallons instead of four into the boiler, to give it an additional cleansing, it is probable that there would have been 340 deaths in this establishment. As it was, each child had taken a quantity just within the fatal dose of arsenic.

This poisonous liquid for cleansing boilers appears to be still in use in some quarters, for in December 1863 an inquest was held in the east of London on the body of a man who by mistake had drunk some beer from a can which had contained the arsenical cleansing liquid. He died from its effects, and five other men were made seriously ill.

From the cases recorded in this report, it will be perceived that, without defining the precise extent of the evil, injury to health and danger to life frequently result from the ignorance, incompetence, and carelessness of persons who are employed in retailing drugs; and that those criminals who are disposed to destroy life by poison, have the greatest facilities afforded to them for this purpose. Further, the careless custody and reckless use of poisons lead occasionally to a large amount of illness, and in some instances cause a great destruction of life.

The suggestions which I beg leave to offer for diminishing these evils are:—

1. That none but qualified persons, educated to the trade of druggists, should be allowed to vend by retail, drugs or medicines capable of acting as poisons.
2. That the sale of poisonous drugs by chandlers, grocers, oilmen, drapers, or small shopkeepers should be strictly prohibited.
   [A licence might, if necessary, be granted, enabling these persons to sell certain specified medicines used by the poorer classes.]
3. That the sale of arsenic, strychnia, and other specified poisons should, after a certain date, be restricted to pharmaceutical chemists and licentiates of the Apothecaries Society. Any other persons acting as druggists not to be permitted to sell them, until they have proved their knowledge of poisonous drugs by undergoing a proper examination.
4. Under no circumstances should boys or girls, or persons who cannot read or write, be permitted to sell poisonous drugs.
5. Some rules are required for the management of a licensed retail trade in poisonous drugs. No youth should be allowed to dispense or sell them, who is not above the age of 18 years, and who has not been for at least one year engaged in the practice of pharmacy, under a pharmeceutical chemist or licentiate of the Apothecaries Society. This restriction not to be applied to one who has passed an examination either at the Pharmaceutical Society or at Apothecaries Hall, as to his knowledge of poisonous drugs.
6. That poisonous drugs and medicines having a similar colour and appearance should not be kept near to each other in similar bottles, drawers, or boxes with similar labels.
7. That less facility should be given for the purchase of arsenic, strychnia, and other deadly poisons which can be used for the purpose of suicide or murder.
8. That no poisonous drugs should be sold to girls or boys under the age of 20 years, on any pretence whatever, and that in all cases of purchase there should be a witness of adult age.
9. All poisonous drugs sold should be distinctly labelled with the name of the drug, the address of the vendor, and the date of sale.
10. That noxious substances, such as arsenic, corrosive sublimate, sugar of lead, and tartar emetic, and others of the like nature, when stored in large quantities in casks or packages, should be distinctly labelled, and kept apart from other substances of an innocent kind which they resemble.
    [Many of the accidents which occur from carelessness in dispensing, and ignorance in administering, medicines, might be prevented by the adoption of Mr. Thomas's patent labels which are provided with a *sand-paper* border. If these labels were generally employed in shops to mark poisonous drugs, and were used in all cases on bottles containing liquids of a noxious kind, and intended for outward use, there would be a great saving of life, so soon as this simple distinction had become known to the public. The mere feeling of the label, even in the dark, would be sufficient to call attention to the nature of the contents.]

No. 16. *Dangers in the Sale of Drugs and Poisons, by Dr. A. Taylor, F.R.S.*

It will be perceived from the reported cases, that the public are at present without any sufficient legal protection against mistakes which are so often fatal. In nearly all cases which are the subject of inquests or trials for manslaughter, it will be observed that proof of *negligence* is not sufficient; the proof must amount to *gross* or *culpable* negligence in law, or the wrongdoer will escape. What gross or culpable negligence is has not yet been defined, but we learn from the verdicts of juries that the keeping of poisons and medicines similar in appearance on the same shelf close to each other is not gross negligence! So the selling of oxalic acid or nitre for Epsom salts, and the keeping of these substances in contiguous drawers or packets, unlabelled until the time of sale, and then labelling the poison as an innocent medicine, does not constitute culpable negligence! The employment of youths of no experience in drugs, who cannot distinguish arsenic from calomel, magnesia, or plaster of Paris,—powdered opium from powdered rhubarb, or laudanum from tincture of rhubarb, furnish, by the destruction of life, merely illustrations of unavoidable accident or misadventure, and not of gross negligence on the part of an employer! If, however, there be any truth in the proposition, *Salus populi suprema lex*, it should apply pre-eminently to cases in which life is exposed to destruction under circumstances in which a person is unable to foresee danger, or to take any precautions against it.

No. 17. *Anthrax-Fever among Cattle at Swineshead, by Mr. R. Ceely.*

No. 17.—REPORT by MR. ROBERT CEELY on an OUTBREAK of CATTLE-DISEASE (ANTHRAX FEVER) at SWINESHEAD.

In accordance with instructions that I should proceed to Swineshead, in Lincolnshire, for the purpose of making enquiries into the recent outbreak there of a malignant disease among cattle, sheep, and swine, I arrived at Swineshead on the 1st of August, and have to make the following report.

Local distribution of the disease.

1. I found the disease had ceased to spread, and that it was expedient for me to visit, for the better prosecution of my enquiries, the veterinary surgeons who had attended the cases in the two affected farms at Swineshead, as well as to ascertain the truth of reports of a similar disease said to have existed or to be still existing in the vicinity. I therefore extended my visit to Heckington, a distance of eight miles, to Donnington about five miles, and to Hubbart's Bridge about three miles, and also to Boston. At Mr. Cooper's farms, situated two miles from the village, but in the parish of Swineshead, where the disease first appeared, I ascertained that no death of previously-affected animals nor any new case of the disease in any animal had occurred since the 26th July. Mr. Cooper had had 21 oxen attacked and one milch cow. 11 oxen and one milch cow had died, the rest were recovering, though looking out of condition and still bearing the effects of counter-irritation, which had been applied to their throats and dewlaps. Out of a flock of 129 sheep, 90 had been attacked, and between 25 and 30 had died. Out of 14 pigs exposed, several had been attacked and six had died, all of the same disease. At Mrs. Glossop's farm, about 1½ mile distant from the above, and nearer the village, her only two milch cows had been attacked with the disease. One died, the other recovered. Four pigs were affected, and two died. At Mr. Revell's, near Mr. Cooper's farm, one pig was severely affected, but recovered. At Mr. Smith's farm, adjoining Mr. Cooper's farm, a ram died, but the report of its sudden death, of a similar disease, was unfounded. Its death was the

Mr. Cooper's farm.

Mrs. Glossop's farm.

Mr. Revell's farm.

Mr. Smith's farm.

result of chronic disease of the foot, leading to sloughing of the integuments round the knee, from position. It had also fatty degeneration of the heart. The disease of the pigs at Hubbart's Bridge was of a totally different nature to that at Swineshead, being chronic abscess of the subcutaneous areolar tissue, variously located in each subject. I could not ascertain that any other cases of malignant disease had existed or were existing in the neighbourhood.

Hubbart's Bridge and other places.

Local history of the disease.

Gangrenous erysipelas in Mr. Cooper's shepherd.

2. It appears that before any disease was known to exist among the animals at Swineshead, Mr. Cooper's shepherd, a stout, healthy, strong, muscular young man, was attacked with what his surgeon denominated "*gangrenous erysipelas*" of the integuments of the forearm. The particulars of this case, as furnished by Dr. Roberts of Swineshead, I think it desirable to record:—"Andrew Pepper, shepherd to Mr. "Cooper, of Swineshead, was, on Thursday, 23rd April 1863, engaged "in rubbing in some oils, which he always uses, into an ewe's udder "which had the '*fellon*.' He had placed his coat upon a wall of the "crew yard, where it remained during the above operation. When "putting it on afterwards, he thought he was bitten by some insect "several times on the forearm. He rubbed the spots, and they imme-"diately became like nettle wheals, and the arm quickly began to swell. "On the following Saturday I saw him. There were then several "pustules where the wheals had been, and the arm was enormously "swollen and inflamed from the wrist to the shoulder. The pustules "speedily assumed a gangrenous state, as did also the upper and under "side of the arm. Several of the pustules coalesced at the bend of the "arm, and a large slough formed. The arm at this time measured 26 "inches in circumference. The symptoms were of a very low type, "shewing great depression of the vital powers, and he was placed under "full doses of quinine, ammonia, port wine, brandy, beef tea, &c., which "checked the progress of the disease. The usual local applications "were employed,—stimulants, antiseptics, &c., and in about three weeks "the sloughs separated, leaving the flexor muscles quite denuded of "fascia. Granulation favourably progressed, and in about six weeks "cicatrization was complete. I conceived the case at the time to be "*gangrenous erysipelas*, arising from poisonous inoculation, and I "have neither seen nor heard anything to induce me to think otherwise, "though the man declares he had neither diseased beast, sheep, or pigs "at the time under treatment, save the usual accompaniments of the "lambing season."

Subsequent outbreak of malignant disease in the cattle, &c.

3. It was not till six weeks after this event, about the middle of June, that the malignant disease broke out on Mr. Cooper's farm. It appeared first on two sheep soon after clipping. They quickly died, and other sheep became affected. In a fortnight afterwards, the oxen, grazing with the sheep, were attacked. The pigs soon afterwards became affected. They were not, at any time, in direct communication with the sheep or oxen, but daily passed over the ground traversed by those animals. The malady at first was confined to one field, where it was supposed to have broken out. After a time that field was cleared of every animal. It was then dressed with agricultural salt, and shut up for three weeks. Then two lots of beasts were put in to graze. In 24 hours, two of the number were attacked, and the disease soon spread to others. Some of the diseased sheep were removed from the field in which they had been attacked, and were brought up to a field near to Swineshead House, a considerable distance, for the purpose of being drenched. In that field was a milch cow, which soon after this introduction was attacked with the disease, and died. The horses, grazing with the affected animals, escaped. All the

Animals affected.

Fields affected.

animals had been bred on the farm, and were in fair condition, having been lately supplied with oil cake. Two dogs, which had lapped a small quantity of the warm blood of the diseased animals, were, in a few hours, seriously ill, but recovered. Two young pigs ate some of the raw and cooked offal with apparent impunity. Other pigs belonging to a butcher, who skinned and dressed one of the oxen, did the same, with a like result. Several persons partook of the cooked flesh of the two first sheep that died, without sustaining any harm. The shepherd cooked a piece for trial, ate it, and declared it tasted like liver, having lost its texture. The pasturage of the farm, from the great heat and long drought of the season, was bare. The land, though undrained, was dry, as were also the deep ditches. The canal adjoining the pasturage supplied the drink for the stock. It communicated with the sea at Boston, and in dry seasons and at high tides its water is brackish, as it then was. At such times, the pike therein generally die, as was the case at and before my visit. The canal had *not* been deepened or cleared out for at least 11 years; but I observed some vegetable matter which had been recently taken out of it, strewed on its banks, as I was told, *after* the outbreak of the disease. The chief part of the vegetable matter consisted of the American weed, the Anacharis Alsinastrum. It was dried up by the action of the sun into a sort of hay, and was readily eaten by the horses and oxen. The adjoining farms, precisely similarly circumstanced, were free from any disease.

Dogs affected.

Pasturage of the farm.

Water used for drink.

4. On the 17th July, during some of the above recited events, one of Mrs. Glossop's milch cows was seized with the disease. It died the next day. On that day, the 18th, the other, which was in calf, was attacked, but recovered. On the 19th four pigs were seized with the disease; two died. The pigs were not in the field with the cows, but were kept near the dwelling-house, fattening for market. Communication with the cows took place when these were brought up to the house for milking. The pigs partook of the milk. To this cause Mrs. Glossop is disposed to attribute the attack of the disease in the pigs. I observed in Mrs. Glossop's field two calves, two pigs, and several sheep grazing with the convalescent cow. They had grazed there before, and during the existence of the disease. They seemed in good health. This farm was differently circumstanced in all respects to that of Mr. Cooper, and at least $1\frac{1}{2}$ mile distant from that. The water in use for drink was in a pond, which, though low, and far from clear, was stated never to be dry. When the cows were brought up for milking, they had spring water.

Mrs. Glossop's farm cows and pigs only affected.

5. Mr. Revell's pig was seriously ill at his residence adjoining the railway station, close to Mr. Cooper's farm. Being a butcher, he had been employed to skin the dead sheep of Mr. Cooper. His pig fell ill after Mr. Cooper had lost seven or eight sheep. It has been intimated that this pig probably ate some of the offal of these animals. The affection of the throat was very severe, and the animal was expected to die, but suppuration ensuing, it ultimately recovered.

At Mr. Revell's only one case in a pig.

6. The cause of the outbreak at Swineshead is certainly obscure. It is seen on two farms widely separated, without communication, and under different circumstances as regards numbers, location, food, and drink; while contiguous farms, similarly circumstanced in all respects, have escaped the visitation. It seems to have arisen in one or perhaps two individuals, and afterwards to have been conveyed to others by immediate or mediate communication. In Mr. Cooper's farm there is some doubt as to which field the origination of the first cases is due. Two

Cause of the outbreak at Swineshead.

fields were used for the sheep, and they having been mingled only a day or two before, it is impossible to say whether the two first cases were due to one or the other of the fields. But the fields were contiguous, and the soil and herbage alike.

Symptoms.

Invasion of the disease generally sudden.

7. The invasion of the disease was most commonly sudden, precursory symptoms being trivial, or more frequently inappreciable. Its course was rapid and often fatal in 24 hours, not unfrequently in one third of that time. The nervous system seemed struck with stupor or paralysis: there was a sudden prostration of power, quickly succeeded by death. In cases more prolonged, when some reaction of the nervous and muscular systems occurred, the pulse was quickened, but small, weak, and tremulous; but sometimes it was normal. The breathing, at first slightly rattling, became quick, laboured, and more wheezing; often suspirious, with slight cough, and oozing of frothy saliva from the mouth; the breath was very fetid; constipation was eventually succeeded by fetid and bloody diarrhœa. In most of the animals, the throat and trachæa were more or less affected, but the affection of these parts, with external swelling, and some dysphagia, were more marked in the pig.

Its zymotic character.

8. The phenomena of the disease clearly indicated its zymotic character. The blood seemed to have imbibed a poison which had caused a change in its constituents; a virus appeared to be developed, which had exerted its malignant influence throughout the course of the circulation and on all the organs and tissues of the animal. Its morbific influence, as shown by its effects after death, was displayed by infiltration of serum or lymph into some structures, especially about the fauces and air passages; sanguineous congestions and softening of organs and tissues; sanguineous exudation under the serous, mucous, areolar, and cutaneous tissues, and into the visceral cavities. These appearances varied in degree, not only in the different species, but in different animals of the same species. In most of the oxen and sheep the spleen was much congested, enlarged, and softened, perfectly friable. In the examination which I made of the last dead ox, exhumed for the purpose on Mr. Cooper's farm, the spleen was less affected than in many of the other cases. In that case, too, there was less congestion, ecchymosis, and infiltration of the mucous membrane and parts about the fauces, œsophagus, and larynx than had been observed before. Sometimes the kidneys and the lungs were more congested than the spleen. In other cases the small intestines contained a large quantity of liquid blood; while in others the bladder contained the most. The ecchymosis of and under the mucous surfaces of the digestive and alimentary canal, and under the serous membranes, varied also in degree. In the pigs, the tonsils and the neighbouring lymphatic glands were much infiltrated; the mucous membrane of the base of the tongue, the fauces, &c., was inflamed, ulcerated, or gangrenous. Dr. Roberts informs me that he saw in one case some of the appearances of *diphtheria*. Mr. Wyer, the veterinary surgeon who attended Mrs. Glossop's animals, informed me that in one pig he found a perfect carbuncle in the pharynx. I had an opportunity of inspecting the morbid parts removed from the throat of a pig by Mr. Dickinson, of Boston. They exhibited the appearances of *angina maligna*, with ecchymoses of the mucous membrane of the glottis and trachæa.

Post-mortem phenomena varied.

In pigs, phenomena resembling those of human angina or diphtheria.

Pharyngeal carbuncle.

Delafond's test could not be employed.

9. The cessation of the disease before my arrival precluded my making a physical and microscopical examination of the warm blood of the

diseased animals,* as well as performing inoculations of it, by the method of Delafond, on healthy animals, with a view to remove all doubt of the true character of the disease, and prove its difference from another equally fatal malady with which he declares it has often been confounded, but from which it is of the greatest practical importance it should be distinguished. But I shall have occasion to revert to this part of the subject. You have, however, already been informed by the highest authority, Professor Gamgee, who had opportunities of observing the disease during life at Swineshead, and inspecting the animals after death, "that the malady had all the symptoms and post-"mortem appearances of *Anthrax Fever*, a disease well known on the "continent," especially in some parts of France.

Denomination of the disease—Anthrax fever.

10. Of late years this disease has been observed in several parts of Great Britain, where it has obtained the denomination of "*splenic apoplexy*," from the frequency with which the spleen has been found congested and enlarged. The impropriety and insufficiency of that term applied to a blood disease, although equivalent to those of Mal de Rate and Milzbrand, so long in use, is too obvious to need remark; but when the same term is applied to two dissimilar blood diseases, it becomes still more objectionable. In the month of October 1860 the same disease, Anthrax Fever, broke out in a farm in Buckinghamshire, at the village of Aston Clinton, near Aylesbury. It commenced in the hogs, and from them extended to the cows and horses. Here, 20 hogs, five cows, and two horses were seized and dead in eight days. In the hogs there was much swelling of the parts about the throat with dysphagia. After death, which was very speedy, much infiltration of the fauces, tonsils, and lymphatic glands was found, and a false membrane, resembling that of *diphtheria*, covered the base of the tongue, the surface of the pharynx, the epiglottis, and the glottis. Dr. Lionel Beale thus describes the appearances on the parts which he had the opportunity of inspecting:—"The layer of false membrane "on the posterior part of the tongue was of a finer consistence, and "about the eighth of an inch in thickness. It consisted of a firm "material, which was fibrillated, numerous small granular cells, about "the size of white blood corpuscles, and epithelial cells of various "ages. From its deep surface, small funnel-shaped processes projected "to the distance of a quarter of an inch into the follicles in the "mucous membrane, at the lower part of which the multiplication of "the granular corpuscles was taking place, apparently with great "rapidity. It is probable that had the animal lived, the condition above "described would have soon given place to the process of suppuration, "in which case the mucous membrane in its entire thickness must "have been destroyed."—(Archives of Medicine, vol. 3, No. X.) The sheep in the adjoining yard, and the rest of the animals in the affected yard, escaped by a timely and distant isolation, under the direction of Mr. Lepper of Aylesbury, the attending veterinary surgeon. The disease was confined to that single farm. A bad atmosphere, in a crowded and ill-ventilated locality, was the presumed cause of this outbreak.

Pre-existence in England under other names.

Outbreak in Buckinghamshire, near Aylesbury, in 1860.

Diphtheria in pigs.

I have been informed of the occurrence of this disease within the last three years in Yorkshire, and also in Northamptonshire. Its outbreak and recurrence in Somersetshire, at Ilchester, was detailed last year in

Anthrax fever in other parts of England.

* At the acme of the *Anthrax Fever*, according to Delafond, the blood which *trickles* from an opened vein is thick, very black, incoagulable, and quickly putrifies. That obtained from punctures, in any part of the skin, exhibits, under the microscope, crenate and stellate globules.

APPENDIX.

No. 17. *Anthrax-Fever among Cattle at Swineshead, by Mr. R. Cecly.*

a most able and interesting report by Professors Simonds, Voelker, and Buckman. The report will be found in the Journal of the Royal Agricultural Society of England (Vol. 94. Part I., No. 50.). Professor Simonds remarks, "that it not unfrequently happens, if an animal bears "up against the disease longer than ordinary, the duration of the "malady being seldom more than 18 hours, that such changes are "wrought in the condition of the flesh as render it poisonous. Cases "have come to my knowledge in which pigs, having eaten such flesh "when thrown into the yard, have died within a few hours. Dogs "have also been affected in a similar manner. These facts still "further show that this disease is truly one that produces chemical "changes in the blood."

During last year some fatal cases are reported to have occurred near Buckingham, also in Derbyshire, Lincolnshire, Northamptonshire, Nottinghamshire, and Staffordshire, as will appear on reference to the Edinburgh Veterinary Review, or Annals of Comparative Pathology, for May to July, or in the reprint "Health of Stock in the United "Kingdom during the year 1862," *by Professor Gamgee.*

In Derbyshire it appears that a dog and some ferrets died from eating the flesh of a bull, dead of the disease. In Northamptonshire it is stated "that some pigs died from eating the spleen of a diseased ox, "and 13 pigs having eaten the offal of an ox, dead with the same dis-"ease, suffered severely. Some died, others were slaughtered, *and all* "*were sent to London.*"

Habits of the disease.

11. In England the disease appears occasionally to have occurred in, and been confined to, a single animal; but most commonly to have prevailed enzootically on one or more farms, making its first appearance on one or two animals, and extending to others in close proximity, on the same farm, with more or less indications of contagion. On the Continent it is said to appear sporadically, enzootically, and epizootically. It is considered to be one of the forms of *charbon, anthrax,* or *pustula maligna.* It has received the name of *anthrax fever, typhus charbonneux sans éruption.* The varieties of charbon or anthrax have been denominated according to the absence or presence of cutaneous eruption, or the order of occurrence of fever or bubo, carbuncle, erysipelas, or sphacelus of the integuments. It is esteemed to be a most malignant disease to which all animals are subject, and in general in some of its forms considered, and justly so, to be eminently contagious.

It is remarkable that when the disease is spontaneously developed in the horse, the ox, the sheep, and the pig, especially if it run a rapid course, it is not often that a carbuncle or anthrax is formed. In other cases anthraces or carbuncles are formed soon after the commencement of the disease; but if the blood of diseased animals becomes the medium of infection to others, and particularly to man, the disease always commences locally by the formation of an anthrax.

The anthrax fever or typhus charbonneux intérieur appears on the continent to vary in severity in different localities and at different seasons of the year. It is more fatal and more contagious when epizootic. Some of its symptoms, as well as its morbid phenomena, are more marked in some species of animal than in others, and there appears also much variation in the degree of severity in animals of the same species.

Intimate nature unknown.

12. Neither the intimate nature of the disease nor its positive cause are considered, by the best and most experienced comparative pathologists, to be known. Various causes have been assigned for its origin,—bad or insufficient food, bad or insufficient water, great heat, unhealthy

habitations, uncleanliness, marshy pasturage, dense fogs, &c. But it is admitted that the disease has been seen under circumstances altogether different from any of the above; that it has arisen in and been confined to a single farm in a populous neighbourhood; that it also has occurred in a single animal, and been propagated to others by contagion.

13. No doubt is entertained of the contagiousness of those forms of charbon or anthrax fever attended with external eruption; but its contagiousness has been denied when unattended with exanthema, especially (says an author of repute*) when it affects sheep; although the author to whom I refer admits at the same time its communicability even to man by the warm blood of the affected animal. Yet satisfactory evidence is on record that this form, like all the others, may be communicated by direct contact, near approach to or communication with the secretions and excretions, or any part of an infected animal, and that the disease may be arrested by isolation. There is equally good evidence to prove also, that all the forms of the disease have co-existed on the same farm, and that they are convertible.† It has been stated by veterinary writers that the pestilential bubos and carbuncles which often attend this, and always accompany the other forms of the disease, have been eaten by dogs with impunity, though the virus inoculated on the same animals communicated the disease. The same impunity, they state, has resulted to dogs and pigs from eating the raw flesh of diseased animals. But the reverse has often been observed, both on the continent and in England; depending most probably on the parts or the quantity eaten, the length of time they have been exposed to the air, or the severity or stage of the disease. All admit, however, that the warm blood of affected animals consumed by dogs and pigs has caused serious illness, the production of disease or death.

Contagiousness among lower animals.

Modes of communicability to animals.

14. There can be no doubt of the general truth of the contagiousness of this disease to man; though there exists some discrepancy of opinion in reference to the modes of communication. When the disease is transmitted to man from the horse, it is always very dangerous, when from the ox, often so, but transmitted from the sheep, it is often light and sometimes only local.‡ There would appear to be three modes by which severe illness, the disease itself, and even death, may be conveyed to man; viz., 1st, by inhalation through the lungs; 2ndly, by the cutaneous absorbents; and, 3rdly, by the digestive organs.

Contagiousness to man.

Modes various.

A few cases only are on record where butchers occupied in the skinning and dressing of animals recently dead of this disease, and while the blood was warm, have suffered severely or lost their lives without any apparent local affection, or, indeed, any visible cutaneous inlet for the introduction of the poison. But such cases are happily rare.§

By inhalation.

The most frequent mode, certainly, of receiving the disease is by cutaneous absorption. The warm blood of the diseased animal, even in that form of the malady in sheep which some have denied to be otherwise contagious, accidentally applied to the mucous surface of the lip or to the slightest abrasion of the cutaneous surface, has given rise to the malignant pustule, and, in some instances, has caused death. The same has happened from a similar incautious application of the

By cutaneous absorption.

* Gasparin, Des Maladies Contagieuses des Bêtes à Laine.
† Gellé, Pathologie Bovine.
‡ Heusinger, Pathologie Comparée.
§ Hurtrel d'Arboval, Typhus Charbonneux. Gellé, Pathologie Bovine. Hufeland's Journal for October 1834.

morbid secretions or excretions, or the virus of carbuncles, bubos, and other eruptions on the body of the animal, to the abraded skin, or through the bites or stings of insects which have been feeding on the dead carcase.

As to the effects of consuming the flesh of animals affected with the disease, the testimony is very conflicting. On high authority, it has been asserted that the flesh of an infected animal, without cutaneous eruption, may be eaten with impunity, provided the animal has been bled before death. In proof of this assertion, the practice of the shepherds of Languedoc is quoted. They are said to cook the flesh of diseased sheep thus treated, and declare it to be "*un morceau délicat.*" It is also stated that in the epizootic of 1714 in Geneva, there was a constant consumption by man, without any bad result, of the cooked flesh of sheep destroyed by malignant glossanthrax, another form of this disease. And that at Turin in 1805, the flesh of diseased oxen was eaten without any other inconvenience than indigestion to those who had partaken of it immoderately, although butchers engaged in the slaughtering and dressing of such animals became ill. There are, nevertheless, too many instances on record of the deleterious effects on man from the consumption of such flesh. In Hufeland's Journal for October 1834, already quoted, and Gellé's Pathologie Bovine, Tome 2d, p. 209, to both of which I would particularly refer, there is indisputable evidence of nearly a whole village suffering severely, and of one death, from malignant pustule, in consequence of eating the flesh of an ox slaughtered while labouring under this form of anthrax fever without eruption.

By the digestive organs.

Conflicting evidence regarding the effects of the consumption of the flesh of affected animals.

15. Veterinary writers of large experience have been struck with the resemblance of some of the forms of this fatal disease to the fièvre intermittente pernicieuse of Italy. Others have been induced to compare other forms, as seen in some species of animal, with gangrenous erysipelas, malignant pustule, or carbuncle in man. In the pigs, where the inflammatory affection of the throat, the entrance to the air passages, and the infiltration of the neighbouring glands is more marked than in ruminants, a striking resemblance has been recognized to *angina maligna* and to *diphtheria* in man.

To what human diseases is anthrax fever analogous?

The cases which occurred in my own neighbourhood three years since, related above (page 3) exhibited the morbid appearances of diphtheria. Dr. Roberts was struck with similar appearances in one case which he saw at Swineshead.

I have lately been informed by Mr. James Freeman, V.S., of Hull, that four years ago, in his practice, he met with several fatal cases of diphtheria in pigs.

The occurrence of the disease denominated *gangrenous erysipelas* in Mr. Cooper's shepherd, just before the outbreak of the malignant disease in that gentleman's stock; the previous epidemic of malignant scarlatina in Swineshead and its neighbourhood, succeeded by that of diphtheria which was still prevalent at the time of my visit, are facts of sufficient importance to need a few remarks. The shepherd's arm undoubtedly exhibited the effects of poisoned punctures. Some of the phenomena closely resembled those of the multiple malignant pustules described by Mr. Bourgeois (Traité Pratique de Pustule Maligne). Had the shepherd's disease occurred after the outbreak of that among the animals which he attended, it would not have been difficult to assign a probable cause.

Pre-existing and co-existing human diseases at Swineshead.

Malignant pustule in man has of late years been noticed in England by several observers. In Somersetshire, where the anthrax fever in animals has occurred and recurred, several cases of malignant pustule

Malignant pustule in England.

have been reported.* Early this year I met with a case in a young girl aged 13 years, in Aylesbury :—it appeared in the upper lip, and proved fatal in five days. In none of these cases could any direct or indirect connection with diseased animals be traced. The spontaneous origin of this malady in man, though not wholly denied by continental authors, is certainly deemed to be very rare. (Heusinger relates three cases occurring in persons occupied in the steeping of flax.) It is quite possible that the causes which originate the disease in the lower animals, may give rise, under favourable circumstances, to its development in man, though with more or less of modification.

Records of the co-existence of angina maligna in man and animals.

We need not revert to *ancient* records for proofs of the co-existence of like diseases in man and animals. Within the last 80 years, "*angina maligna*" in man was concomitant with what was then called "*lues bovina*" in cattle and mules in the island of Grenada, both being of foreign introduction. They appeared and disappeared together. In 1795 the same was observed in the island of Barbados. This "*lues bovina*" was really the acutest form of *anthrax fever*, attended with severe affection of the fauces and air passages. The symptoms during life and the post-mortem appearances were the same. The effects on those who ate the flesh of the diseased animals were the same, viz. pestilential carbuncles with malignant fever, often fatal.† Is the co-existence in Great Britain of the exotics, *diphtheria* in man, and *anthrax fever* in the lower animals, purely accidental?

The Swineshead disease no novelty in England;

16. It will be seen that the malignant disease prevalent at Swineshead in June and July last is identical with that which characterized similar outbreaks in other parts of the kingdom. Such have been noticed of late years only, if we may judge by the reports of agricultural societies and the statements of veterinary practitioners. It is not improbable, however, that, unrecognized, it may have existed here in one or other of its forms for a much longer period. In France, the disease has long been known and amply described by many able and experienced veterinarians, as it occurs in sheep and oxen. In other parts of the Continent, as well as in France, it would appear that *anthrax fever*, internal and external, has too often been confounded with another blood disease, which exhibits internal and external hæmorrhages, congestions, and ecchymoses with rapid fatality, some of the post-mortem appearances resembling the former disease. It will not, therefore, excite surprise if the term "*splenic apoplexy*," now current in England, should be indiscriminately applied to two diseases differing in their predisposing and exciting causes, their essential characters and ultimate effects, and to neither of which is the term appropriate.

nor in other countries;

but sometimes confounded with another disease, and miscalled "splenic apoplexy."

Essential diagnosis of anthrax fever.

17. Professor Delafond, of Alfort,‡ who with ample opportunities has studied both diseases with much care and great acumen, and has described and discriminated them with equal clearness and ability, while admitting occasional difficulty in diagnosis, contends that a correct one, with proper care and attention, can and ought to be made.

Delafond's views of the difference of the two diseases.

He maintains that the disease both in sheep and oxen, called *sang de rate, apoplexie de la rate, hæmorrhagie intestinale, hæmaturie, &c.*, ought not to be considered as localized in any one organ; since the active agent of the morbid phenomena is an abnormal condition of the whole blood, which is superabundant and rich in organic materials, especially the globules. Hence arise congestions, simultaneous hæmor-

* Dr. Wm. Budd on the occurrence of malignant pustule in England.

† Chisholm. Edinburgh Medical and Surgical Journal, Vol. 6. Also Heusinger, Pathologie Comparée, Tome 2d, p. ccxiv.

‡ Traité sur la Maladie de Sang des Bêtes Bovines, etc. etc. Traité sur la Maladie de Sang des Bêtes à Laine, etc. etc.

No. 17. *Anthrax-Fever among Cattle at Swineshead, by Mr. R. Ceely.*

rhages of the spleen, kidneys, lymphatic glands, and intestinal mucous membranes, and not unfrequently external sanguineous accumulations, often rapidly fatal. This disease, which he denominates *maladie de sang*, is caused by hyper-nutrition, derived from natural luxuriant pasturage or injudicious and indiscriminate artificial feeding; that by timely and intelligent care and attention it may be averted, if not successfully treated, when fully formed, and that it is not contagious.

On the other hand, that *anthrax fever, fièvre charbonneuse interne and externe*, consists in the existence of a septic principle pervading the entire organism, through the blood, which undergoes a chemical change, rendering it incoagulable and causing the nervous phenomena of prostration and debility, the internal sanguineous effusions and ecchymoses, the external bubos, tumors, carbuncular infiltrations, emphysemata and gangrene, the rapid putrefaction of the carcase and the property which the blood and the solids possess of transmitting the disease, either by immediate contact or by the infection of a volatile vapour emanating from the blood, the solids, and the secretions. That the nature and seat of the disease, the septic decomposition of the solids, the fluidity of the blood, the softening of the tissues, &c. &c., distinguish *anthrax fever*, after death, from *maladie de sang* and other diseases. That its causes, too, are different, viz.:—1st. Great heat and drought, particularly in marshy and malarious districts, preceded or not by abundant rain. 2nd. Location in uncleanly yards, ill-ventilated stalls, sheds, and stables, where the air is foul and noisome. 3rd. The use of damaged or decayed aliments. 4th. Long and fatiguing journeys. 5th. Contagion.

Practical importance of the distinction.

The importance of a correct discrimination of the two diseases, in a practical, economical, and sanitary point of view, cannot be questioned. The neglect of such discrimination may in some measure account for some of the discrepancies in the statements and opinions of writers relative to the ætiology of *anthrax fever*, and its communicability both before and after death.

Experimental test to determine the fact.

Any doubts on the subject of diagnosis, as remarked by Delafond, may be dispelled by a method equally simple, expeditious, and certain, viz., the inoculation of a healthy animal with the blood or serum of a diseased or recently dead one. If by the insertion and retention from 6 to 12 hours of a pledget of lint or tow, imbued with either of these fluids while warm, within a neat incision into the thickness of the skin and subcutaneous areolar tissue, the animal dies rapidly after four, five, or six days of the inoculation, having previously exhibited the symptoms of *anthrax fever*, the result is affirmative; but if, on the contrary, the wound suppurates and the animal remains in good health, the result is negative as regards that disease, but affirmative as to the case being one of *maladie de sang*.

Disposal of the carcases of diseased animals.

18. The carcases of animals dying of *anthrax fever* ought to be immediately buried deeply in the soil, as much for the benefit of the owner as the safety of the public.

The fatality of this disease, its communicability to all animals, and even to man, under certain circumstances, would justify the most rigid legislative enactments, and claim increased vigilance and intelligence on the part of inspectors at slaughter-houses, markets, and fairs.

Necessity for a rigid veterinary police.

The institution and resolute supervision of public slaughter-houses, wherever practicable, would, no doubt, accomplish much in defence of the public interest. But there is a class of men actively occupied in the purchase and sale of diseased meat, whom present laws seem inadequate to restrain.

No. 18.—Extracts from Reports relating to Outbreaks of Disease, chiefly Typhoid Fever, in various parts of England.

(a.) On Fever and Jaundice at Rotherham and Masbrough, by Dr. Ord.

I. Feb. 26, 1863.

Rotherham and Kimberworth form together one large town, intersected by the River Don.

With regard to the health of the town, it appears from the registers that the death-rate has been high for many years, and I am informed that cholera was very destructive in 1832–33 and 1853–54.

In the nine years from 1841 to 1849 inclusive, the average death-rate per 1,000 inhabitants was for Rotherham 26·8, for Kimberworth 24·1.

The following table exhibits the death-rates for seven years from 1856 to 1862 inclusive :—

Year.	Kimberworth.			Rotherham.		
	Corrected Population.	Deaths.	Deaths per 1,000.	Corrected Population.	Deaths.	Deaths per 1,000.
1856	8,733	206	23·6	7,354	152	20·65
1857	9,023	199	21·82	7,561	166	21·9
1858	9,453	256	27·08	7,768	209	26·9
1859	9,813	257	26·2	7,975	186	23·3
1860	10,173	212	20·84	8,182	178	21·75
1861	10,533	255	24·2	8,389	225	26·8
1862	10,893	326	29·9	8,596	297	34·55
Average Death-rate			24·8			25·12

In the interval between these two periods a very extensive system of drainage has replaced the old cesspools and open ditches, and water obtained from the best local source has been distributed to all parts of the town ; yet the differences in the death-rates of the two periods are only fractional, and in the year 1862 an epidemic of typhoid fever has raised the rate to the alarming proportions of 34·55 per 1,000 in Rotherham, and 29·9 in Masbrough.

Dr. Whitley has doubtless explained to their lordships the nature of the local conditions, which, if not productive of the fever, gave yet a sharper point to its destructiveness. To these conditions must also be attributed the high average mortality of the town, and at the risk of repetition I venture now, with all possible brevity, to enumerate them.

The principal influences detrimental to health in Rotherham and Kimberworth are,—1st. The limited quantity of water available for sanitary purposes. 2nd. The fact that the drainage of the town is constructed upon a plan which pre-supposes the existence of a liberal supply of water for flushings. 3rd. Deficiency of privy accommodation. 4th. Neglect of scavenging. 5th. Certain faults in the construction of houses rendering their efficient ventilation difficult.

1. With regard to the first point, I am informed that after the heavy rains of December, the quantity of water obtained from the springs has been double what it was when Dr. Whitley inspected the town. About

200,000 gallons, or more than seven gallons per head, are now supplied daily to the town.

2. The private drains led into the main sewers under the superintendence of the Local Board of Health, are, as I am informed, everywhere of small calibre. In the absence of a good stream of water they are apt to become choked, a fact which I am enabled to state from personal inspection of some pipes recently taken up in a court in Westgate, which were completely filled with a solid mass of sand and refuse.

The private drains have no ventilation except into the houses, and when they are in any way obstructed the foul air enters the houses, as I am informed, even through the bell traps.

4. The condition of the approaches to many of the common privies is unspeakably filthy, owing to the carelessness and dirty habits of the persons using them. Some of the narrow yards or courts in Westgate and Masborough are very dirty, and in other places, such as Dominy Well Lane, public scavenging is much neglected.

5. Houses.—A large number of the houses are built back to back. In the courts leading out of Westgate, the houses, which are in closely-packed rows, are unprovided with back-doors, and generally want also back-windows. The cramped rooms of such houses, communicating only with a narrow dirty court, smelt very offensively.

Lastly, I am informed that the River Don, which carries through the town the whole sewage of populous Sheffield, five or six miles distant, is, in summer, and in the first rains after drought, very black and stinking. The mud deposited by the swollen river is said to remain a serious nuisance for many days after a freshet. At the time of my visit there was nothing remarkable in the state of the river.

One hundred and thirty-three persons died in Rotherham and Kimberworth, last year, of fever; 58 in Rotherham, 75 in Kimberworth. In January and February fever was prevalent in Kimberworth. It was distributed evenly over Masbrough, and carried off 12 persons; the deaths occurred singly in all parts of the township, both on the flats near the river and on the slopes beyond. For nearly three months fever was absent, till in the end of June it began to be rife in both townships. In July, 12 persons died of fever in Rotherham, and 19 in Kimberworth; in August, 21 in Rotherham, and 31 in Kimberworth; in September, 12 in Rotherham, and seven in Kimberworth. During October and November the disease still lingered, favoured, perhaps, by the warm weather, and even at the time of my visit there were persons ill of well-marked typhoid fever. Regarding the distribution of the disease, I am informed that the better classes and better localities were first attacked, but it will be seen from the accompanying map, on which the localities of fever deaths are marked with vermillion, that it was most fatal in the low lying and densely populated parts of both towns. But in Kimberworth village, 300 feet above the river, and more than half a mile off from the town, the fever was very severe; and in Rotherham, well-built houses, in positions apparently favourable to health, were pointed out as having been severely and fatally visited. No part of the town was exempt from the fever, but its form was most fatal in such places as All Nations' Yard, in Westgate, and Amen Corner, Masbrough, where, around crowded and ill-ventilated houses, the worst nuisances were grouped. Dr. Whitley, who had the opportunity of seeing personally numerous cases of the fever, has probably made their lordships acquainted with its nature and causes; but I have ventured to add the above short account of the distribution of the mortality, in order to complete the history of the epidemic.

The measures taken by the Local Board of Health, since Dr. Whitley's inspection, have had regard chiefly to the improvement of the water supply. I am informed that the board is now seeking parliamentary powers to enable it to obtain water from a very pure source in a pastoral upland three or four miles distant. As far as I can learn, the new supply will be only supplementary to the present, which in dry weather is, according to Dr. Miller's examination, not altogether free from organic impurity. If it be retained, I beg to submit that more care should be taken in preventing the access of impurity. One of the feeding springs flows through a shallow muddy pond, liable, at times, to disturbance by cattle, and rich during the warm season in infusorial forms. This was cut off during the fever epidemic by order of Dr. Shearman, the medical officer of the board, and, unless proper steps are taken to preserve the spring from pollution, should be dispensed with altogether. I am also informed that between the main springs in Wellgate and the pumping station, the water pipes are, at least in one place, perforated, in order to catch some smaller springs; but, as these springs are in the heart of the town, shallow, and near sewers, it is by no means certain that they are pure. It appears to me advisable that all such perforated pipes should be at once removed, and replaced by entire pipes. The board has not felt itself able to deal with the privy accommodation to any great extent. Where privies were pointed out as specially dangerous to the inmates of adjoining houses they have been in a few instances changed into properly constructed waterclosets; but without a proper supply of water, this improvement cannot be widely effected. The inspector of nuisances is charged with the duty of effecting the regular and proper cleansing of the ashpits, which have now been generally substituted for cesspools; but the dirty habits of the people in many places, as above mentioned, frustrate all efforts for their good.

Within the last month or six weeks many persons living in the townships or their neighbourhood have been effected by an illness of which jaundice is the most prominent symptom. From returns furnished by the different medical men of the town, the cases coming under treatment appear to have been about 200 in number; but there are many cases for which medical help has not been sought, and the number of these may be approximately estimately at 100. One death is attributed to the disease.

The following account of the symptoms of the illness is based upon information communicated by medical men, and upon notes of cases personally visited. The attack usually commences with some disorder of digestion,—flatulence, loss of appetite, nausea, or vomiting; vomiting occurs in about half the cases. These symptoms are often introduced by shiverings, and are always accompanied by languor and depression. In many cases there are also distinct catarrhal symptoms, patients feeling "as if they had a cold," with relaxation of the throat, and frequent accumulation of mucus in the fauces. Almost at the same time pain is felt in the epigastrium, together with a feeling of fulness and distension, and with distinct tenderness. Similar conditions affect, with less frequency, the right hypochondrium. After these symptoms, which are unaccompanied by febrility, have lasted for a few days, they abate; and, at periods varying from two days to a fortnight after the first commencement of illness, the tint of jaundice appears in the sclerotics, and spreads over the body; the urine is deeply tinged with bile, and the alvine evacuations are pale or colourless. In the milder cases, the tinging of the urine is often the first indication of the nature

No. 18.
Extracts from Reports relating to outbreaks of disease.

Fever and Jaundice, by Dr. Ord.

of the illness. The liver does not appear to become enlarged, or notably tender on pressure; in fact, there is often no tenderness at all. But the epigastric tenderness remains, and one of the medical men, Dr. Clarke, informed me that in two cases he had felt, projecting from under the edge of the liver, what he believed to be a distended gall-bladder. The tongue is more or less white and coated; the bowels act irregularly, being more commonly constipated than relaxed; and diarrhœa, if assuming a bilious character, often gives much relief. In some cases exhibiting the symptoms usually ending in jaundice, the occurrence of a sharp attack of such diarrhœa appears to have averted the disease. This stage is, like the first, unattended with febrility and the constitutional affection is so mild, that only a few patients are confined to their beds, while many pursue, in-doors and out of doors, their usual employments. The jaundice lasts, generally, from one to three weeks, after which, with or without remedies, it gradually disappears. The single case in which death is attributed to the jaundice, is that of a woman who was seized with the disease a few days before her confinement, and died comatose two days after that event. There is reason, from the experience of other recorded epidemics of jaundice, to connect the death with that disease. And, in the present epidemic, the effect of the disease upon pregnant women has been remarkable. In six cases, abortion or premature delivery has been produced . . . .

Age appears to have some influence. The proportion of persons under 20 years of age attacked by the disease is very small; but among the exceptions are some children. It appears probable that intemperate habits increase the liability of persons to the disease. Neither locality nor occupation appear to affect the development of the disease. The attacks have been scattered over all parts of the town, good and bad, and among all classes.

No facts connecting this epidemic with the typhoid fever exist. Of 27 cases of jaundice reported by Mr. Crowther, one of the medical men of the town, only two had had fever, and I was informed that the experience of other medical men was similar. Where jaundice has occurred in houses previously affected by fever, those inmates who had suffered from fever escaped the second epidemic.

Jaundice does not appear to have spread by infection. I heard of no instance in which it had attacked a whole household; generally only one or two persons have suffered in one house, and there has been no spread of the disease from house to house.

In the absence of information derivable from the examination of the bodies of persons having died from the jaundice, opinions as to the nature of the disease can rest only upon the symptoms. Dr. Reid, one of the medical men of the town, considers the disease to be a form of yellow fever. Other gentleman consider that the liver is the seat of the disease; and others again think that the jaundice is produced by obstruction of the common gall-duct consequent upon duodenal or gastro-duodenal catarrh. The last opinion appears to me most in accordance with the symptoms. On the one hand, the prominence of the epigastric pain, the early gastric symptoms, the absence of enlargement or tenderness of the liver, and the occasional occurrence of catarrh affecting commencement of the alimentary canal, point to an intestinal rather than a hepatic origin of the disease; and, on the other hand, the absence of pyrexia, constant, remittent, or intermittent, added to the fact that the disease has prevailed in cold weather, is opposed to the idea of the disease being yellow fever. The detection

of an enlarged gall-bladder in two cases a further evidence in favour of the view above supported.*

As to the cause of the epidemic, I have but little to suggest. Jaundice appears to have been unusually prevalent in other places than Rotherham, but not to the same extent; its occurrence shortly after an enteric fever is a fact of great interest, though there is no evidence which connects the two epidemics.

In its prevalence in the town jaundice has not appeared to be directly connected with the nuisances detailed in the first part of this report. It has neither been most rife nor most severe in the lower, worst built, and dirtiest parts, yet the prevalence, in epidemic proportions, of a disease which is, at the same time, only more common than usual elsewhere, appears to show that, at all events, the impurity of the atmosphere of Rotherham has favoured its development in that town.

There are on record a few instances in which jaundice has been epidemic. In five out of eight recorded epidemics the jaundice was associated with intermittent or remittent fever, or with spasmodic affections and febrile delirium, and was very fatal to life. In the remaining three the jaundice constituted the most prominent symptom of the disease, was not accompanied by fever, and, except in connexion with pregnancy, was not destructive to life. The last-mentioned epidemics appear from the accounts of them to have resembled in most particulars the Rotherham jaundice.

The first was at Ludenscheid, and is reported in Hufeland's Journal by Dr. Kerksig. The epidemic occurred in autumn after a very warm summer, followed by very changeable weather, with rapid alternations of high and low temperatures. The symptoms were at first those of gastric catarrh, disordered digestion, nausea, vomiting, &c., and the jaundice appeared at the end of 8 to 14 days. The stools were pale, and there was no fever. Of 70 persons who were attacked only three died; one man, and two women who died after abortion. Five pregnant women were affected with jaundice; of these, three aborted, and two being attacked afterwards with fever and delirium, died. Children were to a great extent exempt. Associated with this epidemic was an unusual prevalence of bilious diarrhœa and bilious fever.

The second was at Chasselay, on the Saone, in France. It commenced in October 1841, after several days of thick foggy weather, in a healthy locality. The characteristics of this outbreak were the occurrence of depression, loss of appetite, præcordial distress, pain in the epigastrium, and hypochondrium, followed by the development of the icteric tint, and considerable digestive derangement, without any notable febrility. The chronicler, Dr. Chardon, observes, that the disturbance of the general health was in many cases so slight that, excepting the fact that patients were jaundiced, they would not have known that they were ill. The stools were pale, and the urine loaded with the principles of bile. Most of the persons attacked were adults, but the total number is not given. The epidemic lasted three months, and no one died of it. The disease yielded to simple treatment.

The third epidemic occurred at Martinique in the year 1858. Dr. Saint-Vel, who reports it, asserts that generally jaundice is not more

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* It is proper to mention that the views of Professor Frerichs, which are chiefly adopted in the text, have been vigorously controverted by Dr. Harley, of University College, London, who considers that the seat of obstruction in similar cases is the liver itself, not the intestines or the common bile duct.

common in the Antilles than in France, and that there could be no link between the epidemic and yellow fever, inasmuch as there had been no prevalence of the latter disease in Martinique since the middle of the preceding year. The jaundice appeared in April, was most severe in June and July, and lasted on to the end of the year, making the tour of the colony. It was not associated with any climatic disturbance. It affected all races, adults more than children. Dr. Saint-Vel does not mention any symptoms as attending the jaundice, but states expressly that there were no complications on the side of the liver, and that there was no fever. He considers the disease to have been pure jaundice, *ictère essentiel*. The termination was constantly favourable, except in relation with pregnancy. The only deaths were among women. Three young girls, not pregnant, and one old maid of 60 died of the jaundice; besides these, only pregnant women were the victims. Of 30 pregnant women who were attacked only 10 survived; the remainder died comatose after abortion or premature confinement. "There was only one serious form always the same, always mortal, the comatose form." All the children in these cases died, with one exception. They were not jaundiced. No post-mortem examinations were made.

The general symptoms in the first two epidemics resemble very closely the symptoms observed at Rotherham. Professor Frerichs, who quotes the two cases, indicates them as, probably, instances of jaundice dependent upon gastric catarrh, differing only from the cases commonly met with in their greater extension.

In the third instance there is the same absence of fever and of severe constitutional disturbance, but there is no special account of attendant symptoms, excepting in regard to the effect of the disease upon pregnant women.

In conclusion, with reference to the cause of the outbreak of jaundice at Rotherham, I have to repeat that there is no evidence which specially connects it with any local circumstance in the town. But the defective sanitary state of the town, especially as relates to the nuisances dependent upon defective water supply, to the deficiency and foul state of privies, and to the neglect of scavenging, cannot be too strongly represented to the local authority. Rotherham is full of conditions which at all times impair the health of the population, and specially foster epidemic diseases. Unless active means are used for the remedy of such conditions before the end of the summer, a worse thing yet may fall upon the town in the autumn.

II. May 1, 1863.

The jaundice, which has been epidemic during the last three months in Rotherham, appears, from information given by the medical men of the town, to be now declining. About 14 persons are at present under treatment for this disease, and the number of affected persons who are not in receipt of medical aid is probably equal, and perhaps greater. No change in the nature of the symptoms is reported, but I have to add to the enumeration in my former report the fact that, in most cases, a slight amount of febrility is noticed during the first days of an attack. The febrility does not appear to exceed that which accompanies the earlier stages of any acute catarrh, and is of short duration. In connexion with attacks of jaundice, three more cases of premature confinement are reported, in one of which death by coma occurred on the third day.

The distribution of cases has received particular attention on account of it bearing upon the probable cause of the epidemic. Dr. Hardwicke, who has replaced Dr. Shearman as Medical Officer to the Local

Board of Health, having observed that a considerable number of the cases coming under his care occurred in low-lying places near the river, considers that the jaundice has probably been produced by malaria arising from the banks of the river. He states, that early in the year, three floods occurred in the river, at short intervals, and were followed by unusually warm weather. At ordinary times the river in many places only occupies the central portion of its bed, leaving large stony surfaces at the sides, which are covered only during floods, or after long continued rain. To the action of the warmth upon these surfaces, when covered with mud after the falling of the waters, he charges the production of malaria. But the experience of the other medical men is not to the same effect; their cases having been scattered in all parts of the town, on the high levels as well as on the low. There are certainly no foci of jaundice-production, no defined spots, in which cases have been more thickly grouped than elsewhere. On the other hand, it appears that epidemic jaundice is chiefly confined to Rotherham, and the immediate neighbourhood. In some instances persons residing in towns a few miles off have been attacked with jaundice after a few days' residence in Rotherham, and some of the cases occurring in the surrounding villages may possibly be explained by the fact that the persons attacked had recently been exposed to the atmosphere of Rotherham. But this explanation fails in some instances. Three children, residing in a farm-house near Whiston, a village two miles distant from Rotherham, were among the first attacked. I visited the place, and found that they had not been in Rotherham for some weeks before their seizure. The house, which is roomy and well-built, lies near a small brook, tributary to the Rother, and often overflowing its banks in winter. A servant belonging to this household was afterwards attacked, under similar circumstances. Having heard that jaundice was unusually prevalent in Sheffield and Doncaster (both towns on the Don, one above and one below Rotherham), I made special inquiry in both places, of medical men in large practice. They stated that jaundice, though not absent, was not more frequent than is usual at this time of the year.

The cause of the epidemic is probably to be found in the condition of the atmosphere of the town, and especially of the atmosphere of dwellings.

1. There is reason to believe that the atmosphere is seriously polluted by exhalations from the river and its banks. They are said to be often highly offensive, particularly at night and in still weather.

2. From the obstructed condition of certain drain-pipes which have been taken up and examined, it may be inferred that, owing to insufficiency of flushing-water, the smaller pipes are in other places similarly obstructed. In addition to the pipes seen on a previous occasion, a six-inch pipe from Dr. Shearman's residence was shown to me. It was completely blocked with a hard deposit of sewage and surface-washings, although the house is situated on a hill-side, with an excellent fall. Where pipes are thus obstructed the ground near and above them becomes, in process of times, a diffused cesspool, the gases from which have often but one outlet, the sink-holes in houses. The contamination of the air of dwellings by gases rising through sink-holes was specially noted in my former report; and, on the second visit, many instances were found in which the stinks thus flowing into the lower rooms were most offensive. In one house quick lime was piled round the sink hole, and damp cloths were frequently found placed over the orifice to keep away the effluvia. In several parts of the town, especially in the lower parts of Masborough, drains were

evidently choked, and the surface around the openings into them was sodden with slops and refuse.

The drinking water appears to be of about the same quality as when Dr. Miller examined the specimens sent from this town. In consequence of the dry weather the daily supply is diminishing.

Fever and Jaundice, by Dr. Ord.

At the present moment, just when the jaundice appears to be declining, diarrhœa, not indeed of great severity, is affecting a large number of persons in Rotherham. If the opinion that the jaundice is produced by a gastro-intestinal catarrh obstructing the biliary ducts be correct, three maladies, all chiefly consisting in affections of the intestinal canal, have occurred successively in this place during the last 10 months. The typhoid fever which preceded, and the diarrhœa which seems likely to supersede the jaundice, being both of them diseases which are known to be produced by such impurity of air as is above described, the jaundice may with fair probability be referred to the same cause. The nature of the alteration in the symptoms suggests that a lower tract of intestine is now attacked by the poison. Such succession, without interval, of epidemic malady to epidemic malady, marking the constant operation of influences detrimental to health, demands the most sedulous care in the removal of all obvious sources of atmospheric or other pollution.

The Local Board of Health has, since my former visit, taken several measures for the abatement and prevention of nuisances. In the books of the Inspector of Nuisances I found record of the serving of numerous notices regarding the cleansing, and, where requisite, the alteration of privies, the cleansing of drains, of dwelling-houses, and of house-yards; and in visiting the town, I had great pleasure in observing that considerable improvements had thereby been effected, more especially in such places as All Nation's Yard, True Briton Yard, and "The Orchard." The "Notice," published by the Board of Health, shows also that attention will now be paid to scavenging. Of course much remains to be done in the same spirit before the condition of the houses can be esteemed satisfactory.

With regard to the still more important subjects of increasing the water-supply, and of preventing the admission of sewage-gases into houses, I am unable to report any progress.

(b.) On Fever at Wing, by Dr. Ord.

Fever at Wing, by Dr. Ord.

The village of Wing, together with the hamlet of Ascott, contains about 1,050 inhabitants, among whom about 140 cases of fever and 12 deaths from fever have occurred.

From information communicated by medical men, from accounts given by the sick, and from the examination of persons ill with fever at the time of my visit, it appears that the disease is chiefly typhoid fever. But, mixed with it, have occurred cases in which the short duration of the disease, the absence of diarrhœa, and the predominance of head affections appear to indicate that typhus fever has also been present in the village. All the cases which I had the opportunity of seeing personally exhibited the symptoms of typhoid fever, with, however, less diarrhœa than usual.

The fever appears to have been introduced from two sources, into two distinct parts of the village, and in the earlier cases there is some evidence of its having been communicated from house to house. But

Fever at Wing, by Dr. Ord.

in a compact village, where the people mix freely with one another, all traces of a definite path taken by the fever are soon lost. And, although in several instances there is good presumptive evidence of the importation of fever from one house to another by persons who had nursed, or who had been otherwise in contact with fever patients, I have to report that it has spread most widely, and with most virulence in connexion with certain local conditions unfavourable to health.

These are,—

1st. The small size of the cottages, whereby the sleeping-room of families is very limited, and the living-space is overcrowded.

2nd. Defective ventilation, and dirty condition of the interiors of cottages.

3rd. Impurity of the wells from which drinking-water is obtained; evident in some cases, probable in others.

4th. Nuisances, dependent on inattention to the proper cleansing of privies, of back yards, of slop channels, and of drains, and on the deliberate accumulation of heaps of refuse in the neighbourhood of houses, for the purpose of procuring manure.

The following details will explain the preceding general statement:

The village of Wing stands upon undulating ground, forming the summit of a rounded hill. The soil upon which the village is built is a light gravel, overlying, at depths of from 10 to 30 feet, a dense clay. The general appearance of the village is remarkably clean and pleasing; the roads are well kept, the paths are smooth, and edged with stone, and the exterior of cottages is neat. There is a fair, though far from perfect, system of street drainage, with gratings for the reception of slops from houses. A large proportion of the houses forming the village are labourers' cottages, which are arranged in continuous rows along the streets. Some of these are roomy and well-ventilated, but the interiors of the greater number of those which I visited were cramped, ill-lighted, and ill-ventilated. Many of these are inadequate as dwellings to the number of persons living in them. Such are the numerous houses in which there are only two rooms, one below and one above, for the use of six, eight, or ten persons; the upper room being generally used for sleeping, the lower for cooking and day use. I measured a room of this kind in which seven persons slept; it was 12 feet square and barely seven feet high, and had only one small window, which moreover could not be opened. Another room, in which five persons slept, measured 14 feet by 8 with sloping walls rising to the height of about eight feet. The houses near the gate of the vicarage, in Chapel Yard, at the back of Chapel Yard, and in several parts of Church Street are of this sort; though of course with varying dimensions. The windows in such cottages are usually small; those in the lower rooms are often fixed, but the bedroom window can generally be opened. Very few of the bedrooms have fire-places, their ventilation being very imperfect. The inside of cottages in Wing is, for the most part, much worse kept than the outside. A large proportion of the cottages require whitewashing, and the smell of the close ill-ventilated rooms is often very offensive.

The premises around cottages are generally well kept, but there are instances in the shape of obstructed slop channels, of refuse heaps too near houses and wells, and of one or two large privies placed too near houses, which I pointed out to the local authority as demanding immediate attention. The privies are generally at a safe distance from houses, but they are frequently ill-made and foul, and are numerically

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scanty in proportion to the number of persons using them. The slop drains are in some places obstructed, and give rise to nuisances. This is especially to be noted in the case of the drains adjoining the houses near Wing Park gate, where the pipe leading from the channels in the back yard of a row of houses passes under one house and across the street, receiving in its way the road water through a grating in front of the houses. There is much stench from the grating and from the mouth of the pipe. The ditch above-mentioned, and the outfalls of the drains at the two ends of the village are in a dirty and offensive condition, and complaints are made that stinks issue from some of the street gullies.

The water supply of the village is entire derived from shallow wells, dug through the gravel to the clay, in which little basins are cut for the accumulation of water; such wells, fed by surface percolation through a light soil, are evidently liable to pollution and in three instances at least there is reason to believe that pollution has taken place. The fact that in each of these instances the well supplies several houses will justify a special notice of these wells.

The first is a well in Chapel Yard, known as Bolton's Well. It is shallow, no more than 16 feet deep, and is placed in the middle of a small muddy yard. The walls of the well are of loose brick, without puddling, so that filtration can occur from the surface of the yard. About eight yards distant is a cesspool connected with one of the public sewers. Complaints having been made respecting the quality of the water drawn from this well, the yard was, by order of the authority, cleansed, the mouth of the well was raised, and the well itself cleaned out. The water is said to have been very unpleasant to the taste, and was, in one instance, alleged to be the cause of an outbreak of fever in a house, involving every one of the inmates.

The next is a well behind the houses in Church Street which abut on the churchyard. Within a few yards of the well are two privies with cesspools, and about 20 yards off is the churchyard, on higher ground, with a slope towards the well. After rain the water becomes muddy and unpleasant to the taste.

The third is a well behind Church Row in Church Street. Within six feet of this well, which is shallow and unprotected by puddling, is a large refuse pit, about four feet in diameter and two in depth, made for the reception of ashes, slops, kitchen refuse, and excrements, which accumulate to form manure. There were diarrhœal excrements on the heap when I visited the place. The soakage from this hole after heavy rains can hardly fail to reach the well.

Among nuisances requiring particular notice are the refuse heaps, which, formed for the purpose of making manure, are frequently kept close to the back doors of houses. Such are;—the heap at the door of a house inhabited by a person named Moore in Church Street, the pits in front of houses at the back of Chapel Yard, and the heap behind houses at Wing Park gate; pigsties too near houses; for instance, behind Thorne's house in High Street, and the clogged drains and pools of offensive fluid near Wing Park gate.

The first appearance of fever in the parish of Wing was at Ascott, a hamlet containing about 60 persons, half a mile distant from the village. Two boys in one family were attacked, about Michaelmas last, with a fever, which from the account given of it must have been typhoid. They had not been exposed to any known infection, though one of them had some days before been at Leighton, where there were a few cases of fever. The disease did not spread in Ascott, but soon appeared in a house in the High Street of Wing, the inmates of which

had had some communication with the inmates of the affected house at Ascott. In this house three cases, one of them fatal, occurred. The disease then spread to the next house, all the inmates of which were in succession attacked. These two houses have one common yard behind, and the people in the second house believe that their children contracted the disease owing to the excrements from the fever cases being thrown on to the refuse heaps in the yard. Both these houses and the house at Ascott are roomy, with good windows, and without any nuisance likely to pollute the air of their interiors.

Again, a little later, about the middle of November, fever seems to have been introduced from another source. A young man came from Wingrave with fever, and in the first days of his illness slept in a room with nine other persons.*

Within a fortnight several of these persons were attacked, and in the course of a few weeks five out of the nine had fever, and one died. From these two points fever spread over the village, but not in any definite line that I can discover. In several cases I obtained evidence that the persons first attacked in households had been in contact with fever patients, either as nurses or helpers; and in other cases it was possible that the disease had been brought home by children from the plaiting schools—little rooms in which 20 or 30 young children work together under the care of a woman. But the use of common privies which is almost always accompanied with neglect of proper cleansing of the seat and floor, the sprinkling of excrements upon the surface of refuse heaps in common yards, and the possible infection of wells by such means, will probably account for the spread of fever more than any other communication with affected houses; and the crowded state of the cramped and ill-ventilated houses will account for the extension of fever through the inmates.

There were two remarkable instances in which fever ran through the inmates of one house in the middle of a row without spreading to the houses adjoining, where the conditions in all were much the same, excepting that in the houses attacked there were large families of children, and in the others few or none. In one of these instances the family was the only one in the row which drank the water from Bolton's well . . . .

The vicarage, the best houses in the village, and most of the well-built houses in High Street have escaped the disease. There are four groups of houses in which fever was most virulent. These are—first, the houses at the end of Church Street close to the churchyard. They are 10 in number; two at the end furthest from the church are well built, without nuisances, and with a private well. In these there was no fever; in the others 11 cases occurred, and their inhabitants are generally sickly and subject to diarrhœa. In one of them I saw three persons suffering from fever, two men and a young woman, lying in one room. The houses are very small and cramped, and behind them is the second well of which I have spoken above. The two privies

* [From Dr. Harvey of St. George's Hospital, who, on private professional business visited Wing during the time of the epidemic, I received information exactly in the sense of the above report. Two cases of overcrowding which Dr. Harvey observed were the following:—A young woman of 19, having fever, "lay in a room occupied at night by her father and mother, her bastard child, two young men (her brothers) and her two sisters each with a bastard child, 10 persons in all. A few weeks ago 13 persons slept in it." In a second houses, "in the downstairs room (whither they had been moved at the doctor's orders from the bedroom where seven persons ordinarily slept), lay in one bed two young men, and in the other bed the sister with her bastard baby. The lads and woman all had fever." J. S.]

Fever at Wing, by Dr. Ord.

near the well were in a dirty state, and there was much excrement lying about the approaches.

The second group is called Church Row, and with Ginger's Yard adjoining contains 15 houses. In the six houses of the row nearest to the High Street, which are well built, only one case occurred in a family of nine persons. In the other houses which are smaller, and generally with only two rooms, but provided with large moveable windows, there were 26 cases and two deaths from fever. In one of these houses 10 persons sleep in a bedroom and a closet. The bedroom, which is small, accommodates eight of the number. Four severe cases occurred in this house. Behind these houses is the third well of which I have spoken, and the refuse pit (in which I have reason to believe that I saw fever excrements) lies between the well and the houses.

The third group is called Staple's Yard, and abuts on the High Street; in the five houses forming this group 18 cases occurred, eight of them in one house. The associations are a foul privy in a corner between houses, dirty back and front yards with refuse heaps, foul slop channels, and a well of very doubtful purity, combined with house arrangements similar to those already described.

The last group is less defined. It embraces the houses in Chapel Yard, the houses at the back of the yard, and a few houses around. Conditions similar to those before-mentioned are repeated here; namely small rooms with bad ventilation, suspicious water supply, and various nuisances in the shape of refuse heaps and dirty privies.

(c.) ON THE SANITARY STATE OF COCKERMOUTH, BY DR. STEVENS.

Sanitary State of Cockermouth, by Dr. Stevens.

The town of Cockermouth in Cumberland is situated on the south bank of the river Derwent where that river receives the water of its tributary the Cocker. The latter river runs through the middle of the town. The population in 1831 was 5,775, and in 1861 5,388.

The town consists of one long tolerably wide street, across which run others at right angles. Down three of these cross streets run underground ill-constructed sewers, which empty themselves, or should empty themselves, into the Derwent; but, owing to their faulty construction, and the absence of water sufficient to flush them, they serve but little purpose as drains.

There is no main drain in the main street, and if there were the absence of an adequate supply of water would render its use very limited. It results that the large majority of the houses have no means of drainage whatever.

The streets of Cockermouth are paved with small round boulders, both for horseway and footway; in fact there is no distinction or line of demarcation between the two, except a slight depression by way of gutter. Into this gutter is thrown or finds its way, if not previously soaked up by the imperfectly paved road or footway, all slops, fluid sewage, and refuse. The state of the main street on a market day defies description. The cattle-market is held in the main street, there being no other convenience provided. Then the street can hardly be called a thoroughfare; besides the actual occupation of the space by cattle, sheep, and pigs, the dirt caused by them, and the half-paved condition of the street, render walking almost impossible. Some of the best houses in the town are inaccessible at these times, especially

in wet weather (not an infrequent occurrence in northern towns), owing to the ankle-deep slush and nastiness caused by the animals, even on the door-steps of the dwellings. And it is not an uncommon occurrence that the houses are still further invaded by cattle and pigs.

'Many—a large proportion—of the houses of the poorer classes in Cockermouth are very badly built, closely packed together in narrow zig-zag and intricate courts, badly or hardly at all ventilated, almost entirely excluded from the sun's direct rays, and very insufficiently lighted. The courts in which the worst houses are found appear to have been openings to the back gardens of better houses abutting on the main or other streets. These back gardens or yards have been built upon no careful plan, and apparently bit by bit, as the houses or hovels erected are not systematically placed, but in many instances are approached by very circuitous and curiously ill-contrived and narrow passages, in some instances hardly wide enough to admit of the passage of a corpulent man, and often very deficient in height. Some of these houses consist of only two rooms, one on the ground floor and one over, approached by an outside staircase, being two separate tenements; many of them built back to back; and very few of them possess windows which can be opened at all. Some of them have a single pane of glass so contrived that it may let in a little air; opening, perhaps, two or three feet from the opposite wall of an adjacent house, and into an alley reeking with the emanations from a filthily saturated soil, and the atmosphere of the neighbouring hovels, filled with the necessarily squalid inhabitants of such domiciles.

The common lodging houses were much in want of regulation, being overcrowded, badly built, ill-ventilated, and very dirty. In one I visited I found one dormitory for six persons thirteen feet by nine feet, and seven feet high, giving 136 cubic feet for each person. In another room in the same house were four four-post bedsteads, in which the previous night had slept nine persons. This apartment afforded 138 cubic feet for each of the nine; but as on some occasions many more were accommodated in the same room, the space for each would be reduced to a very dangerously small allowance. In these rooms the windows could not be opened, one small pane only being available as a means of inviting a change of atmosphere. While standing on the stairs outside the dormitory door, the apartment below being occupied by ten or a dozen persons, the air was found to be so foul that a speedy retreat was rendered imperative. This was between two and three o'clock in the afternoon. What must be the condition of these rooms in the middle of a July night!

From the foregoing the condition of the yards may be gathered. Where there was space in the yard this was generally largely encroached upon by a midden, generally constructed above the ground of unconnected slabs of slate-stones, with its privy perched on one end, or in some instances on a level with the yard and midden floor. These middens, especially after rain, allowed their contents to flow over the yard, often altogether unpaved, or imperfectly covered with boulders. In Black Lion Yard I found such a diffuse cesspool, and in Linton's Yard was a very offensive midden; the houses back to back; no back-door; no opening to the windows. Another source of dirt and loathsome smell was caused by the buildings erected on adjacent properties having been very generally set nine inches or a foot distant from each other. These spaces (probably left owing to some old custom, which compelled the constructors of new buildings to keep clear of or allow for the "drip" of neighbouring houses,) are quite useless, and almost beyond the reach of the most assiduous scavenger. They are the receptacles of all kinds

of waste broken pots and pans, refuse, garbage and sewerage matter. They are the constant resort of cats and dogs and vermin, and afford a powerful additional reason, if any such were wanted, for the speedy demolition of large masses of inhabited hovels in the town which are utterly unfit and can never be rendered fit for human habitation.

The middens and privies, the middens standing in the stead of the ordinary cesspool, were generally in a very neglected state. Many blocks of houses had only one privy in common. Some houses had none. In Hall's Yard, leading out of Derwent Street, was found a midden and privy in a very bad state. In Bell's Yard, in same street, there were a much neglected midden, unlimited soakage, and overflowing surface drains. The midden contents were flowing out into the yard at the time of my visit, and children were playing with the dirt and filth.* These middens are only emptied at very uncertain and distant intervals, and are an intolerable nuisance. In Irish Yard there was standing water, high above the ground-flooring of the houses; the floors were constantly wet. Here there was always typhoid or typhus fever.

Great numbers of pigs are kept in Cockermouth, almost invariably in a very dirty state. The sties are for the most part situated close to the houses, and in some instances in them. In Muckworth Row several pigsties were situated at the raised end of a back yard; there were also several heaps of pigs' manure, and a filthy and unsecured midden. At all times more or less, but certainly after rainfall, the drainage from these flowed unchecked into the houses situated at the lower end. In Pump Yard, Kirkgate, the lower room of tenement of a two-roomed structure, such as before alluded to, was occupied by several pigsties (14 pigs have been counted in them on one occasion). On opening the door of this piggery, situated in a most confined and crowded locality, the effluvium was abominable; some of the pigs were lying on rotting straw and filth at least one foot in depth. The space between the sties was partly occupied by heaps of pig manure, and the remainder was so sodden with the more fluid dirt of the sties that it could not be trodden on without great circumspection. This yard is bounded by a brook, called, owing to its offensive smell and foul contents, the Skitterbeck.

There is a market-house for the sale of meat, vegetables, &c. in Cockermouth, and against one side of this is built a range of slaughter-houses, which might fairly answer the purpose of their construction if they were properly attended to. They were not securely paved, and the walls were soiled with blood, which, from its hard dry condition and black colour, indicated the lengthened period which had elapsed since the last attempt at cleansing had been made. In some of them were heaps of bowels, offal, blood, and sawdust, all more or less offensive to the smell at the time of my visit. At each slaughter-house, at the far and dark end, was a pen, doubtless intended for the temporary detention of the animals while slaughtering was going on. In one of these pens I found six sheep and in another a calf tethered. This was long after the period for slaughtering, and I was given to understand that it was the practice of the butchers to keep the animals in these places from week to week, often for a considerable time.

Cockermouth is very badly supplied with water. The river water, said to be very pure before it reaches the town, is very inaccessible to those of the inhabitants who live in the higher part of the town and in the neighbourhood of the salubrious part of the stream. In the

* Here the medical officer told me he had had five cases of typhoid fever.

lower part of the town the water is more easily obtained, but it is then no longer fit for culinary purposes.

The inhabitants rely for their supply of water for all uses almost entirely upon the wells, which are tolerably numerous. The supply is, however, often precarious; pumps continually fall dry, and, owing to the nature of the soil, a loose gravel, the water in the wells is liable to contamination from the neighbouring middens, faulty drains, and general soakage.

Sanitary State of Cockermouth, by Dr. Stevens.

The rate of mortality in Cockermouth is commensurate with the gross inattention to ordinary sanitary arrangements set forth in the foregoing remarks. The average annual death-rate is 27·6 per 1,000 of the inhabitants. Typhoid fever is a constant visitor in certain blocks of houses. Diarrhœa is very prevalent, and fatal to the almost unprecedented extent of 3·9 per 1,000 of the inhabitants annually. The inhabitants of the workhouse have suffered very severely by diarrhœa, clearly aggravated, if not caused, by the almost entire absence of drainage, and the propinquity of pigsties and foul middens. Some improvement in the workhouse health has been secured by the removal of the middens to a greater distance from the house, but a great deal remains to be done in the way of drainage, paving, &c., before the house is placed in a fit state for the residence of its large population.

(d.) ON FEVER AT WHITEHAVEN, BY DR. BRISTOWE.

Fever at Whitehaven, by Dr. Bristowe.

Nature and history of the fever epidemic.

I was informed that fever had been very common in Whitehaven up to about 14 years ago; but that from that time up to the commencement of 1862 it had, with the exception of occasional sporadic cases and of an unimportant outbreak in 1856, practically disappeared. About the beginning of last year fever cases began to be not uncommon; they continued somewhat numerous throughout the year 1862 and the first three months of 1863. During 1862 21 fever deaths were registered in the Whitehaven sub-district, of which nine occurred in the infirmary; and during January, February, and March of the present year four deaths from the same cause were recorded, of which three took place in the infirmary. At the end of March and the beginning of April a sudden and severe outbreak occurred in a place called Capel Terrace, near Hensingham, about two miles from Whitehaven. Capel Terrace consists of about 40 new-built small houses, of which the majority, but not all, were occupied. None of the inhabited houses escaped fever. The terrace is situated on the side of a hill, is badly drained, and the drinking-water is derived from the surface soil, and I am informed was distinctly impregnated with soakage from pigsties, &c. In April, May, and June the disease continued; and in the two districts of Whitehaven and St. Bees 13 deaths occurred, of which five were returned from the infirmary. In the latter part of July the disease almost suddenly assumed alarming proportions, breaking out simultaneously all over the town, and attacking the well-to-do as well as the poor, the elderly as well as the young. From that time up to my visit the epidemic has prevailed with remarkable severity. The medical men tell me (speaking roughly) that they have attended during this period at least 1,000 cases, and the records of deaths inform me that from the beginning of July up to the 3rd September 55 persons had died of the disease. Of this number 17 were registered in the sub-district of St. Bees, and 38 in that of Whitehaven (including seven

deaths in the infirmary); 10 occurred in July, 43 in August, and two in the first three days of September. The epidemic has in fact been so severe as to cause no little panic both in the town and in the neighbourhood. Six policemen out of a force of 14 have suffered, and several persons of position have been carried off by it, including one of the curates and one of the medical practitioners. The epidemic has, however, during the last three weeks, been sensibly on the wane. From the great severity of the disease, from the prevalent belief in its contagiousness, and from my examination of the register of deaths (which showed that out of the total number of fatal cases which had been registered since the beginning of the year no less than 27 had occurred in persons upwards of 40), the impression which I at first took was that the epidemic had been one of true typhus. This impression, however, was soon dispelled by the information which I obtained from the medical men, and by the observations which I was enabled to make upon the fever cases in the hospital at the time of my visit, and on those persons suffering from fever whom I saw at their own houses in the course of my inspection. I was informed that in the great majority of cases diarrhœa formed a prominent symptom, that cutaneous rash (with the exception of sudamina, which were common,) was very rarely detected, and that convalescence was much protracted; further, that many persons, evidently suffering from slight attacks of fever, were yet able to pursue to some extent their ordinary avocations. All the cases which I had the opportunity of examining were unquestionably cases of *typhoid*. There can be no doubt, therefore, that the epidemic has been essentially an epidemic of typhoid or enteric fever; a disease which has been conclusively shown to depend on the poison of putrid and excrementitious matters. And there can be no doubt that it has prevailed in an unusually virulent form, as is evidenced by the large number of persons attacked, by the proportionally large number among the sufferers of adult and even of elderly persons, and by the many instances met with in which spread by contagion seemed almost certain. The following is one among several examples of supposed contagion which were related to me. A girl suffering from fever was removed from Whitehaven, four weeks before my visit, to an isolated cottage four miles distant in the country, where her family, at that time in good health, were residing; three weeks afterwards her brother and sister were admitted into the hospital with the same disease (I saw them in the hospital, and have no doubt that they were suffering from typhoid fever), and the father (remaining at home) was said to be labouring under similar symptoms.

The disease, however, has not spread in the hospital to nurses or to other officials.

Condition of the town of Whitehaven.

Whitehaven is a seaport town on the coast of Cumberland. It occupies a narrow valley and the slope of the adjacent hills. It is built on "the outcrop of the coal formation, and edge of new red sandstone-limestone and slaty rocks rising to the surface eastward."* The lower part of the town stands on a diluvial deposit. Coal and iron are abundant in the neighbourhood, and there are extensive coal mines and iron works. The borough contains 18,842 inhabitants. A cursory examination of Whitehaven would lead to the belief that it was a cleanly town, and not undesirable as a place of residence. The chief streets are tolerably wide and clean, and the houses have an air of respectability. A very little examination, however, serves to dispel this illusion, and indeed I have no hesitation in asserting that there is no English town

* Mr. Rawlinson's Report.

with which I am acquainted where the sanitary circumstances (with one or two exceptions) of the inhabitants, and especially of the poor, are in a more disgraceful and degrading condition. The houses of the labouring population (more particularly in the central parts of the town) are crowded together in a way which is scarcely conceivable; the houses themselves are for the most part dirty, dilapidated, and imperfectly (if at all) ventilated; they are overcrowded, and the cellars are habitually let out as tenements; houses, courts, and even streets are without any privy accommodation, and where privies are provided they are of the most objectionable kind, and generally most objectionable as regards their situation; drainage scarcely exists.

It is worth while to go a little more in detail into these circumstances.

Crowding together of houses.—There are, in all parts of the town, courts and alleys of various sizes and shapes, in which the dwellings of the poor are situated; the majority of these are narrow (from 3 to 6 feet or more wide) are approached by covered passages, have houses of 2 or 3 stories on each side, and terminate, it may be, in a high wall, or in a house or some equally serious impediment to the circulation of air. But this statement gives no notion of the state of affairs in the more crowded parts of the town. Here you turn, by a narrow passage, out of one of the comparatively respectable streets, and you find yourself in a labyrinth of irregular passages from 2½ to 4 feet wide, communicating with one another between houses, or through houses, or under houses, in the most complicated way; the houses themselves immediately bounding the passages on all sides, excepting in an occasional nook where room has been found for an ash-pit and midden or for a pig sty. It would seem that many years ago the majority of houses abutting on the streets were provided with small back yards or gardens; and that as the labouring population increased, these plots of ground became appropriated to dwellings for them; that without plan, without thought for the comfort or health of tenants, without any supervision, landlords crowded together on their separate plots as many houses as the plots could be made to hold; and that thus the deplorable result which I have endeavoured to describe was gradually attained.

Condition of houses.—The houses themselves vary very considerably in size. They are from 1 to 3 stories high, and generally have a cellar. They are mostly let in several tenements; and the cellar, as a rule, is let separately from the rest of the house. They are commonly dilapidated and dirty, and have little or no provision for ventilation. They are often built back to back, and even when otherwise circumstanced have rarely back-lights. In a few instances the windows open by sashes; but far more frequently the windows do not open at all, or at most a single pane of glass is made to open. The closeness and fetor of the atmosphere in many of these habitations is extreme. The cellar tenements consist generally of a single room, 7 or 8 feet high, buried under ground to within a foot and a half of the ceiling. They have one window, or more rarely two, which do not omit of being opened, and a door through which alone ventilation can take place. One of these which I visited measured about 12 feet long by 12 wide, and was occupied by a man, his wife and 4 children; and an open trough, suspended against the wall, passed through the room, carrying the sewage from an adjoining yard. Tenements generally are greatly overcrowded, and the poverty in many cases presented by the inmates is very deplorable.

Privy accommodation.—The condition of things here is gross. There are many courts and alleys, with 20 or 30 houses in them, and I believe even streets comprising tolerably respectable houses, without a single

Fever at Whitehaven, by Dr. Bristowe.

privy of any description. Men relieve themselves where they can, women are compelled to resort habitually to the chamber pot, and children necessarily fall into more offensive habits still. The result as regards the houses themselves is, that in most cases the chamber utensils, with their fæcal contents, are retained in the bed-rooms until the dusk, when they are taken out and emptied into some neighbouring midden, or (by those who live near it) into the harbour, or it may be into the gutter. I am informed that in some instances they are actually retained within the house for a couple of days. Here and there privies are provided, but in the majority of cases they are very offensive, and occupy objectionable situations, being either within a house, underneath a house, or closely hemmed in by houses. In Town Hall Buildings, a well built, decent looking place . . . . occupied by policemen, the privies are on the basement floor within the houses, and have no means of ventilation except through the houses. In Patterson's Buildings, a court containing 13 three-storied houses, there is a single privy and ash-pit at the end of the passage and under one of the houses. In Solomon's Temple, a wretched locality . . . . occupied by numerous families, there is a privy for the use of men only. The kind of privy in use here is one that is common in the north of England; it is a privy communicating at the back with a square uncovered brick-built receptacle, which receives, in addition to the contributions from the privy, the ashes and other refuse of the inhabitants. The privies (to which I have already referred) intended for the use of men alone are places without any door, and of which the seat consists simply of a crossbar.

Drainage.—Practically there is none. There are indeed "three "main sewers in the town, flagged in the bottom, and arched over "above," and a "number of inferior sewers which cannot be rightly "traced."* But there is no drainage whatever for water-closets; and surface drainage is very partial, and the drains are not trapped. In most of the courts there is a gutter running down the centre, which carries off the surface water, and whatever offensive matter may happen to escape from the middens, or pigs, or may be thrown into it. These pass out into the adjoining streets, along which they run until they find their way into some covered sewer. I have mentioned one case in which such a drain was carried through a cellar tenement; but there are many cases in which such drains, closed in by an imperfect covering, pass from one court to another, along the passages or through the rooms of houses, flush with the floor.

A large number of pigs have been kept by the inhabitants, and have added very materially to the insalubrity of the place; but these, in consequence of the prevalence of fever, had all been removed shortly before my arrival in the town. The paving of the courts is generally extremely bad.

I have alluded to one or two exceptional circumstances, in which Whitehaven is to be commended; these are, 1st, that all burials have been discontinued in the grave yards within the town; and, 2ndly, that there is an admirable water supply. Water is laid on from the River Ennen, a few miles below Lake Ennerdale. The water is abundant and good, and provided on the constant supply principle all over the town; and the poorer inhabitants, although they have not the water laid on to their houses, have within easy distance a stand-cock and an unfailing supply.

Causes of Fever.—The condition of things disclosed in the statement just made amply accounts for the present epidemic of fever. Indeed

* Mr. Rawlinson's Report.

it is difficult to suggest any measures for producing typhoid fever so likely to be efficient as those which have allowed Whitehaven to be degraded into its present filthy state.

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(c.) On FEVER at FESTINIOG, by DR. BUCHANAN.

Fever at Festiniog, by Dr. Buchanan.

I have to report that fever has existed in the Festiniog Union during the whole of the year 1863, but more particularly since June. It had not previously been epidemic in the district for 20 years. The disease has affected almost exclusively the part of the parish of Festiniog which lies in the mountains to the north of Festiniog village.

The villages of Bethania, Tanygrision, and Glanypwll, inhabited by labourers in the adjacent slate quarries, have suffered most. In other parts the cases of fever have been more or less isolated. The number of persons who have suffered from fever cannot be exactly ascertained, but among a population of six or seven thousand in the affected districts there have probably been not less than six or seven hundred cases of fever. In the villages named, scarcely a house has escaped, and often five or six persons have been affected in a house. . . . .

The fever is typhoid. The cases seen by myself differed in no respect from the ordinary type of this disease as witnessed in London. The duration of the illness has been long, and convalescence has been protracted . . . . . Its mortality appears to have been small; the 67 deaths that have occurred representing a death-rate of ten per cent. or thereabouts of the presumed number of attacks, and it is believed that the mortality has even been lower than this.*

. . . . . .

The hospital accommodation of this district consists of a building of two wards, each capable of containing eight patients. It was erected by the owners of certain quarries to receive accidents. One ward has latterly been set apart for cases of fever occurring in quarry labourers. A hundred and five men have been received here; but the great majority of men, and all the women and children, have been treated at their own residences.

The conditions under which the population of the affected districts are placed have been investigated with respect to their probable influence in causing the fever. The villages are situated on the sides or at the foot of mountains, where the air is pure, and the natural drainage good. The water supply for some domestic purposes is obtained from the stream in the valley. This water is exposed to

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* Upon analysis of the death registers, it is found that 67 deaths occurred from fever in 1863 in the sub district of Festiniog; 58 of these were in the parish of Festiniog, including four deaths in the quarry hospital; four were in the parish of Llanfrothen; three in the parish of Trawsfywyad; and two in the parish of Maentwrog. Of the 67 deaths, five were people engaged in agricultural pursuits, or in their families; eight were in persons engaged in trade or service; two were in men of somewhat better class; and the remaining 52 deaths occurred among persons employed in some department of slate quarrying, or in the families of such persons. The 67 deaths comprised 36 males and 31 females; and their ages were as follows: Under 5 years old, 8; between 5 and 10 years, 3; between 10 and 20 years, 19; between 20 and 30 years, 19; between 30 and 40 years, 8; between 40 and 50 years, 4; between 50 and 60 years, 5; and one woman died at the age of 64. In the hospital records, 7 deaths from fever are shown. The matron and a person dying with some other disease complicating his fever, appear not to be entered upon the registrar's list among the fatal cases of the hospital; but even 7 deaths out of 105 cases of typhoid in adults is a very small death-rate.

Fever at Festiniog, by Dr. Buchanan.

constant contamination; but it was stated positively, and with remarkable accord, that it was never under any circumstances employed for drinking. Water for internal use is got from wells on the mountain side, presumably situate above any possible source of pollution. Only at Bethania was there much reason to believe that a drinking water had got contaminated by drainage.*

In the quarry villages the houses are usually built with sufficient space around them. They stand singly or in pairs, or else are built in rows, but only here and there are they arranged along the sides of regular streets. The great majority of houses have no privies or ash-pits attached to them, nor have their inhabitants access to places of this sort. The custom of the neighbourhood is to use the fields, or when house utensils are used to empty them at a little distance from the houses. Houses in a row are generally provided with one or more privies, with cesspools common to the row. Such privies are often in an offensive condition. The paving about the houses is usually pretty good, so that rain readily washes away filth.† A good deal of paving is, however, in a defective state.

The houses of the Carmarthen Slate Company form a hamlet above Tanygrision. They are well drained and ventilated, and have a privy to each house, some six or seven yards at the back. There has been very little fever here, and none of a severe sort.

The cottages in the affected villages are for the most part cleanly; more so than would be supposed, when the number of their inmates is considered. Cases of fever have been more severe in those cottages which are habitually dirty.

The condition about the houses that calls for most serious attention is their overcrowding. The cottages were built for single families, and contain, for the most part, two or three rooms. Owing to the employment for the past two years of a much larger number of labourers in the quarries than formerly, there are not houses enough for all who want them‡, although many new cottages have been recently built. Every house, therefore, is sublet. As many lodgers as can be received are crowded into each room, and the family of the house share the same rooms. There is no supervision over these houses, although they are in the most technical sense common lodging houses. Hence the possibility of such tenancy as the following:—

There is a row of cottages at Glanypwll called Treddoll, each of which consists of a good sized day-room, a sort of cellar, and a bedroom on the ground level, and of an upper bed-room or loft, approached by a ladder from the day-room. The dimensions of the lower bedrooms are about eight feet by six feet superficial, and five and a half

* Acting on the advice of Mr. Vaughan Jones, the people have ceased to drink the water of such wells as are situated below the level of adjacent houses. Though it was very positively stated by numbers of persons that they never drank the water of the streams, it is difficult to feel sure that a strict separation would be made in their use, if two sorts of water were admitted into a house.

† Of course contaminating the streams. There has been an unusual amount of rainfall in this district since August. By the greater pollution of rivers it is conceivable that the special prevalence of typhoid this year might have been brought about, bad water being one of the accepted causes of the disease. But apart from the fact that the river water is rarely used for drinking, the experience of most country districts, as well as of towns, has shown that typhoid is commonly less prevalent in a wet autumn. Of another way in which the wet season may have assisted to cause the fever in this district mention will presently be made.

‡ Labourers are attracted from some distance by the profitable employment that is to be had. Many of them lodge in the district all the week, and return to their families between Saturday and Monday. This high rate of wages in the quarries makes building labour scarce and dear.

high; it can of course only contain one bed; the lower sash of it window opens, but can only be kept open by a prop. The loft measures about twelve by six feet superficial, and its roof (sloping from about two and a half feet at the wall to six and a half feet in the middle) has an average height of about four and a half feet. In this loft are two or even three beds. Light is admitted by one pane of glass replacing a slate in the roof. There is no opening for air, except the door into the day-room. The cubic capacity of the lower bed-room is therefore under 300 cubic feet, and of the upper sleeping-room under 350 cubic feet. Now in one cottage of Treddoll ten people sleep at night; five of the family and five lodgers. Three lodgers sleep in the lower room; the family and two lodgers in the loft. There has been one case of fever here. In another of the cottages, twelve people have slept by night in the two rooms. A man, his wife, two grown sons, a daughter of eleven, and three lodgers, occupied the upper room. A married daughter, her husband, and two children, slept downstairs. In this house there were six cases of fever, and a child died of it; and so on for other houses in this row. In every house of the row there has been fever.*

But the whole tale of overcrowding in the slate villages is not even yet told. The quarry labourers work by relays; some by day, others by night. As a day labourer leaves his bed in the morning he makes room for a night worker who has just returned home. Reeking with his labour, with no change of clothes, and latterly almost always wet through with rain, this man takes his bed or his portion of bed, and his fifty cubic feet of air, hot as they have been left by his fellow.†

All the quarry labourers are not lodged in these cottages. Others of them sleep in a sort of barracks at the quarries. These are not so seriously crowded as the private lodging-houses; but they too are tenanted by day sleepers as well as night sleepers, and it does not appear that there is adequate provision for a proper renewal of air. They are often kept in a very dirty state.

The fever has been most prevalent and severe in the crowded houses. Some mild cases have also occurred in clean cottages, not overcrowded. But few cases have occurred in the barracks.

Another condition that in the opinion of the medical attendants has been an important cause of the disease is exposure to cold and wet. This cause affects the quarrymen especially, who get heated at their work, and often get chilled and wet upon leaving it. In the present wet autumn, indeed, it is believed that the men's clothes have scarcely ever been properly dry. Those who come from a distance bring no change of clothes for the whole week.

The population as a whole is sufficiently fed. Their chief diet consists of bread, butter, and skim cheese, with sometimes potatoes. Most of them eat meat once a week. Their drink is generally tea, and the workers get beer. They are, as a rule, temperate.

* The married daughter, with her husband and remaining child, have since gone to live elsewhere. This row of houses, though probably the worst in Glanypwll as to crowding, cannot be regarded as exceptional in the quarry villages.

† This practice is known to the medical men to be common in the district. At the time of my visit, being Monday, the night workers who lived at a distance had not yet returned in force to their week's work. The instances observed by myself of persons sleeping by day in the beds occupied by others at night were therefore few. The people of the house usually deny the practice in question; as they have been much blamed for it.

THE END.

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